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ARS-115 (1992)

August 1993

National Potato Germplasm Evaluation and Enhancement Report, 1992

Sixty-Third Annual Report
by Cooperators

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Agriculture

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Research
Service**

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August 1993

National Potato Germplasm Evaluation and Enhancement Report, 1992

**Sixty-Third Annual Report
by Cooperators**

Edited by Kathleen G. Haynes

Vegetable Laboratory,
Beltsville Agricultural Research Center,
Agricultural Research Service,
U.S. Department of Agriculture,
Beltsville, MD 20705.

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United States Department of Agriculture
Beltsville Agricultural Research Center (BARC),
Beltsville, Maryland, and Chapman, Echo Lake,
and Aroostook Farms, Presque Isle, Maine

K.G. Haynes, R.W. Goth, and D.R. Wilson

Introduction

Objectives: The USDA potato breeding program at Beltsville has four main objectives: (1) to develop improved pest-resistant germplasm lines and varieties; (2) to develop improved germplasm lines and varieties for processing directly out of cold storage; (3) to enhance germplasm for specific characteristics relating to pest resistance, yield, environmental stress, human nutrition and consumer acceptance; and (4) to develop statistical genetic models for some of the new breeding strategies.

New Variety

Suncrisp, tested as B9792-8B, will be officially released in 1993 by the Agricultural Research Service in cooperation with Florida, Pennsylvania, and New Jersey. Suncrisp is a very late maturing chipping variety resistant to race A of the golden nematode, PVY, and heat necrosis, and it has some tolerance to late blight. Yield and specific gravity has been equal to 'Atlantic'. Chip color has been slightly lighter than 'Atlantic'. This variety has the potential in the southern states to extend the chipping season when 'Atlantic' goes off-grade due to heat necrosis. It processes after 2-3 months in cold storage. Tuber appearance is only fair, limiting its potential for fresh market.

Breeding

BARC: Hybridizations in the greenhouse at BARC in early 1992 were made among tetraploid clonal material possessing resistance to scab, Verticillium wilt, bacterial wilt, early blight, and soft rot; high quality; processing and fresh market potential; red and purple skin; yellow

flesh; and adaptability to various ecological test zones. Eight hundred eighty crosses were successful. Interploidy hybridizations were made between the tetraploid and diploid populations for yield, specific gravity, and yellow flesh. Thirty seven crosses were successful.

Echo Lake: Open-pollinated seed from 72 families was collected from a random mating diploid specific gravity population.

Germplasm Enhancement and Varietal Development

Chapman Farm: Of the approximately 25,800 seedling tubers planted, 3,609 were saved for replanting in 1993. Of these, 1,750 were for a study on resistance to bacterial wilt; 384 were for a study on resistance to heat necrosis; 204 were for a study on resistance to scab; 360 were for a diploid yellow-flesh study; and 911 were part of the normal selection scheme for varietal development. Of the 971 clones evaluated in 12-hill plots, 282 were saved for evaluation in 40-hill plots in 1993. Of the 215 clones evaluated in 40-hill plots, 96 were saved for evaluation in 60-hill plots. Of the 145 clones evaluated in 60-hill plots, 46 were saved for evaluation in 80-hill plots. Of the 96 clones evaluated in 80-hill plots, 42 were saved for evaluation in 100-hill plots. Of the 48 clones evaluated in 100-hill plots, 22 were saved for evaluation in 150-hill plots. Of the 25 clones evaluated in 150-hill plots, 16 were saved for evaluation in 200-hill plots. Of the 46 clones evaluated in 200-hill plots, 26 were saved for evaluation in 200-hill plots. Out of 234 clones evaluated for resistance to *Erwinia* sp., 111 were saved for further testing.

All index materials planted on Chapman were done in tuber units with six feet between rows and five feet between units to continue the virus/viroid indexing program.

Seed tubers of promising clones and standard varieties were distributed for adaptability and/or

processing trials and/or preliminary evaluation to Maine, New York (Upstate and Long Island), New Jersey, Pennsylvania, Virginia, North Carolina, Florida, Michigan, Ohio, California, and Colorado.

Echo Lake: Seventy-two diploid clones were re-evaluated for specific gravity. An additional 72 diploid clones and 28 tetraploid clones were evaluated for yellow flesh.

Processing Evaluations

Echo Lake: Round white (Tables 1-5), russet (Tables 6-7) and red-skin (Table 8) yield trials were planted in a randomized complete block design with four replications of 25 hill plots at Echo Lake in May. Plants were spaced at 9 inches within the row in the round whites and reds, and at 12 inches in the russets. At harvest tubers from each plot were graded, specific gravity was determined by the weight in air and weight in water method, and a sample of tubers was cut to determine the presence of hollow heart and internal necrosis. Tuber samples were stored at 40°F, 45°F, and 50°F. Samples were processed out of 40°F, 45°F, 50°F, and following a three week reconditioning period out of 40°F during January and February. For each combination of storage temperature and processing date, 10 tubers per sample from each plot were cooked (40 samples per clone).

Potato chips were made from each round white and red sample by taking 1/16-inch slices from cross and lengthwise sections of each tuber. Lengthwise chips were used to detect possible increase in reducing sugars, particularly near the stem end. Slices were rinsed in water and placed on paper towels to remove excess moisture. Chips were then fried at 340°F in Primex vegetable shortening until bubbling ceased.

B0172-22: This line continues to show promise for the chipping industry. Over the last four years it has yielded 97% of Atlantic, with a

specific gravity close to Atlantic. Chip color has been acceptable out of 50°F storage in January. Hollow heart can be a problem. It has some resistance to Fusarium. Tubers are oblong and flat.

B0178-34: This line looks very promising for the chipping industry. Over the last four years, it has yielded 93% of Atlantic in our trials. Yields have slightly exceeded Atlantic at other locations. Specific gravity is equal to Atlantic. Chip color has been very good out of 50°F storage in January. It is resistant to golden nematode and PVX. Tubers are oblong and flat.

B0564-9: This line has been tested for two years in our replicated trials. It has yielded 95% of Atlantic with a specific gravity equal to Atlantic. It has not processed out of January storage. However, it has produced light colored chips when processed out of the field in the southern states. It is also resistant to heat necrosis. Tubers are round, oblong, blocky, and have a very nice appearance.

B0717-1: This line has been tested for two years in our replicated trials. It has yielded 106% of Atlantic with a specific gravity slightly lower than Atlantic. Chip color out of January storage has not been good.

Russet types were processed into french fries. A 3/8-inch diameter plug was cut from the cross and lengthwise sections of each tuber, washed, dried, and fried at 360°F for five minutes.

B9922-11: This line looks very promising as a fresh market or early season french fry russet. Over the last four years, it has yielded 95% of Russet Burbank with a specific gravity slightly higher than Russet Burbank. It is resistant to golden nematode, Verticillium wilt and common scab. Tubers are oblong to long and somewhat flat.

B0169-56: This line may have some potential as a fresh market or processing russet. Over the

last four years, it has yielded 101% of Russet Burbank with a slightly higher specific gravity than Russet Burbank. Internal quality has generally been good. It is resistant to Verticillium wilt. It has looked good in the southern states. Tubers are oblong to long.

B0339-1: This line may have some potential as a fresh market or early season processing russet for the northern states. Over the last four years it has yielded 101% of Russet Burbank, with a slightly lower specific gravity than Russet Burbank. Susceptibility to heat necrosis will make it unsuitable for the southern states. Tubers are oblong to long and somewhat flat.

B0493-8: This line may have some potential as a fresh market russet. Over the last three years it has yielded 133% of Russet Burbank with a specific gravity equal to Russet Burbank. Tubers are oblong to long and somewhat flat.

After frying, each potato chip and french fry was classified into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French fry classes ranged from 1 = very light to 5 = very dark. Weighted averages were calculated by multiplying the number of chips or french fries in each color class by the color class, totaling, and dividing by the number of chips or french fries in each sample. Color ratings were made by using the PCII reference color chart 1206-U.

Disease Resistance

Verticillium: Approximately 1,330 lines and their parents were evaluated for Verticillium wilt and pinkeye in the second year of the heritability study.

Late blight: Twenty-nine advanced selections and three checks were evaluated for late blight resistance (Table 9). All were either as resistant or more resistant than Atzimba. Disease pressure was intense. This plot was planted in a randomized complete block design with two

replications. Plots consisted of eight hills per clone spaced nine inches within the row. All tubers were harvested, graded, and specific gravity was determined. Five tubers from each plot were stored at 50°F and chipped on January 11, 1993. Few of the late blight resistant selections appear to have any processing potential, B0711-1 and B0750-2 being possible exceptions. The extremely variable yield can be attributed to the small plot size. The most resistant lines will be entered into our normal yield trials at Echo Lake in 1993.

Scab: Twenty-two advanced tetraploid selections and three check varieties were evaluated in the upper scab plot in a randomized complete block design with four replications (Table 10). Each plot consisted of five hills per clone spaced nine inches within the row. All tubers were harvested and individually scored for type of lesion (0 = none, ... 5 = pitted) and surface area covered (0 = 0% to 5 ≥ 75%). For each plot, a lesion index (LI) and a surface area index (AI) were computed as the sum of the type lesion or surface area covered times the number of tubers with that type lesion or surface area covered, respectively, divided by five times the number of tubers. An overall scab index (LAI) was computed as the sum overall tubers in a plot of the type lesion times surface area covered divided by 25 times the number of tubers. B0339-1 was the most resistant line. Good resistance was also observed in B0348-2 and B0616-1. Seventy-two diploids were evaluated in the lower scab plot. These tetraploids and diploids will be retested in 1993.

Statistical and Genetic Modelling

In cooperation with Dr. David Douches at Michigan State University, the coefficient of double reduction in tetraploid potatoes was estimated for several isozyme loci (TAG 85:857-862). The inbreeding coefficient of haploids was defined and it was shown how a haploid could be more inbred than the parent from which it was derived (Am. Potato J. 70:339-344). A

summary article on recent theoretical statistical genetic work on 4×2 crosses was written at the request of the Biometric Society (Biometrics Bulletin 10(2):25-26).

Summary

Considerable progress is being made in all four objectives in the USDA potato breeding program. A good chipping variety, Suncrisp (B9792-8B), is in the process of being released. Several other promising lines include B0178-34, B0564-9, B0717-1, B9922-11, B0339-1, and B0493-8. Genetic studies are continuing on the inheritance of resistance to Verticillium wilt, scab, and heat necrosis and are beginning for bacterial wilt. We continue to evaluate the diploid germplasm base for yellow flesh, scab resistance, and specific gravity, and to intercross these diploids among themselves and with the tetraploid germplasm base. The most resistant clones to Verticillium wilt, late blight, and soft rot are being increased for horticultural evaluation. Statistical genetic modelling is continuing in an effort to facilitate the incorporation and exploitation of the diploid germplasm into the breeding program.

BARC Table 1. Yield, tuber size distribution, and quality characteristics of round whites top-killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution				SG ¹	Internal Defects	
			<17/8"	17/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"		HH ²	HN ³
Atlantic	400	95	3.9	27.5	55.8	11.6	92	15	0
B0172-22	340	92	2.6	18.4	48.9	24.3	90	8	0
B0174-16	293	93	6.6	35.3	50.7	6.8	92	1	0
B0175-20	314	89	4.0	20.0	52.2	17.1	86	19	0
B0175-21	329	92	3.3	20.6	56.2	15.6	92	2	0
B0176-24	361	93	4.5	28.3	51.5	13.6	92	9	0
B0177-20	331	93	6.7	33.7	54.3	5.3	93	0	0
B0178-30	402	95	3.2	17.5	58.0	19.1	83	12	0
B0178-34	355	89	3.4	19.0	47.0	23.2	93	14	0
B0178-35	347	91	7.0	32.1	45.2	13.9	95	5	0
B0179-18	344	94	3.0	16.8	53.8	23.7	86	3	0
B0180-24	332	89	9.1	30.2	47.1	12.1	72	8	0
B0184-18	417	89	9.0	40.0	34.7	14.7	82	0	0
B0209-1	369	89	4.4	12.6	51.0	25.0	73	5	0
B0245-15	310	94	3.5	16.3	56.6	20.7	84	10	0
B0246-6	374	97	1.8	20.8	54.7	21.9	82	2	0
Monona	283	92	7.2	32.3	55.3	4.5	67	6	0
Norchip	309	90	9.5	42.7	42.6	5.1	83	8	0
LSD (.05)	55						06		

¹ 1.0 omitted

² Number of tubers out of 20 with hollow heart

³ Number of tubers out of 20 with internal necrosis

BARC Table 1 (continued)

Temperature Date	50°F 1/11	45°F 1/14	40°F 1/19	40°-70°F 1/19	50°F 2/1	45°F 2/4	40°F 2/2	40°-70°F 2/22
Pedigree	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	7.9	S	8.7	S	9.5	O	7.8	S
B0172-22	7.9	M	8.3	S	9.5	O	7.7	S
B0174-16	7.7	S	8.7	S	9.8	O	8.2	S
B0175-20	8.1	S	7.9	S	9.4	O	8.1	S
B0175-21	8.1	S	8.1	S	9.4	O	7.3	S
B0176-24	8.5	O	9.0	O	9.4	O	8.9	S
B0177-20	7.8	S	8.8	S	9.8	O	7.4	S
B0178-30	8.9	L	9.3	M	9.9	S	9.2	S
B0178-34	7.0	M	8.2	S	8.6	O	8.1	S
B0178-35	9.2	M	9.3	M	9.9	O	8.9	S
B0179-18	8.5	M	9.3	S	9.9	O	8.1	S
B0180-24	9.6	VL	10.0	M	10.0	S	9.3	M
B0184-18	8.8	S	8.6	S	10.0	O	9.0	S
B0209-1	8.0	S	8.6	S	9.9	O	8.8	S
B0245-15	7.1	O	7.9	S	8.7	O	7.1	S
B0246-6	8.2	VL	8.3	L	9.0	O	7.3	M
Monona	8.3	M	8.5	S	9.6	O	7.8	S
Norchip	8.7	S	9.3	M	9.7	S	8.7	S

⁴Chips 1-7 = satisfactory⁵Sprout length 0 = no sprouts, S < 0.5", M 0.5-1.5", L 1.5-2.5", VL > 2.5"

BARC Table 2. Yield, tuber size distribution, and quality characteristics of round whites top-killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution				SG ¹	Internal Defects	
			<1 7/8"	1 7/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"		HH ²	HN ³
Atlantic	449	94	3.9	25.8	51.8	16.4	2.1	11	0
B0256-1	431	92	2.3	15.4	49.1	27.8	5.4	0	0
B0257-12	395	89	10.2	28.3	46.2	14.2	1.1	0	0
B0257-3	293	87	11.9	35.4	42.0	9.3	1.4	2	0
B0257-9	351	87	6.4	18.9	43.3	25.2	6.2	3	0
B0386-9	397	93	4.7	22.0	55.9	15.0	2.4	1	0
B0405-4	341	90	9.9	57.4	30.7	2.1	0.0	3	1
B0405-6	388	95	4.4	33.8	55.1	6.0	0.7	1	0
B0473-6	385	90	9.7	46.4	33.4	9.9	0.5	1	1
B0554-1	414	89	1.8	11.7	46.8	30.4	9.9	3	0
B0564-12	339	91	7.7	24.9	49.6	16.2	1.7	15	0
B0564-6	463	91	2.3	11.4	52.2	27.5	6.6	11	0
B0564-8	379	90	5.6	22.6	55.2	12.4	4.2	9	0
B0564-9	447	88	3.0	15.9	45.7	26.0	9.5	6	0
B0566-5	349	94	6.2	33.6	52.0	8.2	0.0	1	0
B0583-2	429	86	2.5	13.0	46.4	27.0	11.2	17	0
Kennebec	433	86	2.4	14.6	47.5	24.3	11.2	8	0
Superior	458	95	3.4	24.1	55.3	15.4	1.8	1	0
LSD (.05)	51								
							05		

¹1.0 omitted

²Number of tubers out of 20 with hollow heart.

³Number of tubers out of 20 with internal necrosis.

4,5 See Table 1

BARC Table 3. Yield, tuber size distribution, and quality characteristics of round whites top killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects		
	CWT/A	%Mkt	<1 $\frac{7}{8}$ "	1 $\frac{7}{8}$ -2 $\frac{1}{4}$ "	2 $\frac{1}{4}$ -3 $\frac{1}{4}$ "	3 $\frac{1}{4}$ -4"	>4"	SG ¹	HH ²	HN ³
Atlantic	402	95	4.0	25.7	55.6	14.2	0.6	93	17	0
B0583-8	333	93	6.9	35.7	48.4	9.0	0.0	91	14	0
B0585-1	339	90	4.7	20.2	47.9	21.5	5.6	82	4	0
B0585-5	311	91	4.3	16.9	47.0	26.9	4.9	74	8	0
B0585-6	373	94	5.5	23.3	55.4	15.1	0.7	76	9	0
B0586-3	356	96	2.4	20.0	57.0	19.3	1.3	93	4	0
B0587-9	310	90	4.7	23.5	47.1	19.3	5.4	80	5	0
B0602-1	366	88	9.6	32.5	43.5	12.4	2.0	69	13	0
B0608-1	364	98	2.5	20.0	57.2	20.3	0.0	85	8	0
B0608-5	375	92	7.8	38.5	44.7	8.4	0.5	69	1	0
B0610-2	379	90	8.3	38.6	45.5	5.9	1.7	82	1	0
B0613-2	419	93	4.0	23.6	52.6	16.4	3.4	77	11	0
B0622-2	405	93	4.2	18.6	58.5	15.8	2.9	81	15	0
B0635-6	367	93	4.9	16.6	48.0	28.0	2.5	88	15	0
B0674-9	325	95	2.4	13.1	51.1	30.8	2.6	80	0	0
B0675-4	360	95	2.9	19.0	56.7	19.0	2.4	85	12	0
Coastal Chip	396	92	4.0	20.1	51.2	20.7	4.0	85	8	0
Superior	376	95	4.9	27.7	51.7	15.7	0.0	78	1	0
LSD (.05)	58							05		

¹1.0 omitted

²Number of tubers out of 20 with hollow heart

³Number of tubers out of 20 with internal necrosis

4.5 See Table 1

BARC Table 4. Yield, tuber size distribution, and quality characteristics of round whites top killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt CWT/A	%Mkt	% Tuber Size Distribution					SG ¹	Internal Defects	
			<17/8"	17/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"	>4"		HH ²	HN ³
Atlantic	494	94	3.9	19.5	56.9	17.7	2.0	94	12	0
B0676-7	406	81	2.4	9.9	42.8	28.4	16.6	76	13	0
B0682-2	494	93	3.4	15.3	53.0	24.7	3.5	90	5	0
B0682-6	435	87	3.9	13.4	45.5	28.0	9.1	84	18	0
B0684-1	340	87	3.1	11.5	47.8	28.0	9.7	79	7	0
B0684-5	393	84	1.6	10.6	37.4	35.7	14.7	73	5	0
B0687-14	400	91	8.8	31.4	45.6	13.6	0.6	78	2	0
B0717-1	519	94	5.7	24.4	59.2	10.3	0.5	85	2	0
B0717-8	411	93	3.5	14.3	57.6	21.4	3.2	83	5	0
B0720-1	407	94	4.4	17.1	52.5	24.7	1.4	80	2	0
B0720-4	415	93	4.1	20.4	52.7	20.0	2.8	73	5	0
B0723-2	382	94	2.4	10.9	47.5	36.0	3.2	87	5	0
B0723-7	459	90	4.0	17.6	47.8	24.4	6.2	74	5	0
B0726-14	381	91	6.3	24.1	52.0	15.2	2.3	82	6	0
B0726-18	383	95	3.5	15.5	59.4	20.2	1.4	81	10	0
B0728-5	419	95	2.4	12.8	52.6	29.3	2.8	88	6	0
Monona	395	95	5.0	27.7	60.1	7.2	0.0	70	3	0
Norchip	440	94	5.5	29.8	57.7	7.0	0.0	83	11	0
LSD (.05)	52							05		

¹1.0 omitted

²Number of tubers out of 20 with hollow heart

³Number of tubers out of 20 with internal necrosis

BARC Table 4 (continued)

Temperature	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date	1/12	1/14	1/20	1/26	2/1	2/4	2/8	2/23
Pedigree	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	9.2	M	9.2	S	8.2	S	9.2	M
B0676-7	8.9	O	9.2	O	9.0	S	9.9	O
B0682-2	9.2	M	9.8	S	9.1	S	9.8	S
B0682-6	9.1	S	9.4	S	9.0	S	9.8	O
B0684-1	8.5	S	9.1	O	8.3	S	9.2	O
B0684-5	9.1	M	9.3	M	9.7	M	9.8	S
B0687-14	7.9	VL	9.0	M	7.7	M	9.0	S
B0717-1	8.5	VL	9.0	S	8.4	M	10.0	S
B0717-8	6.7	S	7.7	S	7.0	S	8.7	O
B0720-1	8.7	S	9.0	M	9.1	M	9.8	S
B0720-4	8.9	M	9.0	S	8.9	M	9.6	S
B0723-2	7.7	S	7.8	S	7.2	S	8.7	S
B0723-7	7.2	S	8.1	S	8.0	S	8.5	S
B0726-14	8.5	VL	8.2	M	7.6	L	8.9	S
B0726-18	7.1	M	7.9	S	7.0	M	8.7	S
B0728-5	8.8	S	8.6	O	8.8	S	9.4	O
Monona	8.7	M	8.8	S	8.1	S	9.5	O
Norchip	9.0	S	9.6	S	9.3	S	10.0	S

^{4,5}See Table 1

BARC Table 5. Yield, tuber size distribution, and quality characteristics of round whites top-killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt		% Tuber Size Distribution						Internal Defects		
	CWT/A	%Mkt	<17/8"	17/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"	>4"	SG ¹	HH ²	HN ³	HN ³
Atlantic	457	93	3.9	18.9	53.0	21.0	3.3	91	14	0	0
B0735-9	373	87	12.9	43.0	35.9	8.2	0.0	85	1	0	0
B0753-16	398	94	3.8	23.5	54.8	16.1	1.8	92	16	0	0
B0753-9	440	93	5.6	17.9	57.2	18.2	1.0	86	0	0	0
B0756-6	339	94	3.4	20.8	62.3	10.8	2.8	89	3	0	0
B0757-17	465	95	1.8	11.9	47.2	35.6	3.6	93	7	0	0
B0758-28	330	91	8.4	30.7	42.2	17.7	0.9	86	6	0	0
B0760-15	437	97	2.9	18.5	56.4	21.7	0.5	87	3	0	0
B0761-3	382	93	5.0	19.7	53.5	19.9	1.8	87	0	0	0
B0761-6	379	95	3.1	14.8	52.1	28.3	1.8	84	6	0	0
B0763-15	408	90	2.2	10.5	55.9	24.0	7.4	86	18	0	0
B0763-7	362	91	6.7	24.0	50.0	16.9	2.3	93	7	0	0
B0766-3	394	84	3.1	10.2	41.2	32.7	12.7	82	17	0	0
B0779-10	456	95	5.5	29.7	55.6	9.2	0.0	90	1	0	0
B0809-10	392	91	8.7	35.3	46.3	9.8	0.0	91	0	0	0
B0810-7	429	93	5.1	27.9	50.2	14.4	2.3	98	13	0	0
Kennebec	437	86	3.0	13.2	46.8	25.9	11.2	82	15	0	0
Monona	381	95	5.2	23.9	58.0	12.9	0.0	67	6	0	0
LSD (.05)	48							06			

¹1.0 omitted

²Number of tubers out of 20 with hollow heart

³Number of tubers out of 20 with internal necrosis

BARC Table 5 (continued)

Temperature Date	50°F 1/12	45°F 1/14	40°F 1/20	40°-70°F 1/26	50°F 2/2	45°F 2/4	40°F 2/8	40°-70°F 2/23
Pedigree	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt
Atlantic	9.2	S	9.9	O	9.3	L	9.9	S
B0735-9	8.7	VL	9.4	S	9.7	VL	9.8	S
B0753-16	7.8	L	8.7	O	7.8	VL	9.5	S
B0753-9	7.4	M	9.2	O	8.4	M	9.8	S
B0756-6	7.7	S	9.3	O	8.9	M	9.7	O
B0757-17	6.7	M	7.9	O	7.7	L	8.8	O
B0758-28	7.4	S	8.4	O	7.8	M	8.7	O
B0760-15	8.0	L	9.0	S	8.6	L	9.3	O
B0761-3	8.0	S	9.4	O	8.2	M	9.1	O
B0761-6	9.0	M	9.8	O	9.0	M	9.8	O
B0763-15	7.0	M	9.0	O	7.7	M	9.5	O
B0763-7	7.5	S	9.6	O	8.4	M	9.5	O
B0766-3	7.6	M	8.3	S	8.1	L	8.8	S
B0779-10	9.4	M	9.9	O	9.5	M	10.0	O
B0809-10	8.0	S	8.6	O	8.4	S	9.3	S
B0810-7	8.0	S	9.0	O	8.6	S	9.2	O
Kennebec	9.0	S	9.8	O	9.2	M	9.7	O
Monona	8.3	M	9.3	O	8.6	L	9.6	O

^{4,5}See Table 1

BARC Table 6. Yield, tuber size distribution, and quality characteristics of russets top-killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects		
	CWT/A	%Mkt	<2 oz	2-6 oz	6-10 oz	10-16 oz	>16 oz	SG ¹	HH ²	HN ³
B0169-56	354	71	7.5	21.8	23.0	26.1	21.5	82	4	0
B0186-1	338	89	4.7	39.0	23.5	26.8	5.9	83	0	0
B0186-3	308	86	13.0	45.0	24.8	16.2	1.0	87	0	0
B0220-14	328	85	8.7	31.6	24.2	29.5	6.0	81	3	0
B0306-6	388	85	5.2	34.9	20.2	29.9	9.9	82	3	0
B0311-2	349	78	7.7	28.4	20.8	29.2	13.9	84	2	0
B0312-10	352	81	5.5	32.1	21.8	27.2	13.3	86	6	0
B0316-19	326	76	5.9	23.1	20.1	33.0	17.8	81	1	1
B0324-25	335	82	4.1	27.9	23.8	30.3	13.9	79	7	0
B0329-1	333	81	10.0	36.6	22.9	21.9	8.5	78	2	0
B0338-2	296	84	12.5	50.4	20.0	13.8	3.4	70	8	13
B0339-1	340	79	3.6	26.2	23.2	29.3	17.6	74	8	0
B0348-2	344	89	8.7	41.9	23.0	23.7	2.7	85	1	0
B0362-2	247	82	12.4	49.1	23.5	9.1	5.9	94	3	0
B0427-7	336	84	9.8	36.0	28.4	19.3	6.5	82	9	0
B9922-11	371	85	5.3	31.1	26.6	27.0	10.0	85	1	0
Coastal	370	90	6.6	31.6	26.5	31.7	3.7	77	0	0
Russet										
Russet	384	81	9.7	40.0	22.4	18.8	9.1	83	20	0
Burbank										
LSD (.05)	53							04		

¹ 1.0 omitted

² Number of tubers with hollow heart

³ Number of tubers with internal necrosis

BARC Table 6 (continued)

Temperature	50°F	45°F	40°F	40°-70°F	50°F	45°F	40°F	40°-70°F
Date	1/12	1/19	1/13	1/27	2/3	2/3	2/5	2/23
Pedigree	Fry ⁴ Spt ⁵	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt
B0169-56	4.5 L	4.7 S	5.0 O	4.7 M	4.5 VL	4.8 M	5.0 S	4.9 M
B0186-1	3.5 M	3.6 M	4.0 O	3.1 M	3.9 VL	3.5 L	4.2 S	3.5 M
B0186-3	2.7 M	3.3 S	3.6 O	2.7 S	3.0 M	2.9 S	4.2 S	2.7 S
B0220-14	2.8 M	3.4 M	3.4 O	2.9 S	2.8 L	2.7 M	3.7 S	3.3 S
B0306-6	4.4 M	4.6 S	4.7 O	4.8 M	4.1 M	4.5 M	4.9 S	4.8 M
B0311-2	4.2 S	4.0 S	4.7 O	4.1 S	4.3 S	4.4 S	5.0 O	4.3 S
B0312-10	3.3 S	3.7 S	4.0 O	2.9 S	3.1 M	3.3 S	4.1 O	3.0 M
B0316-19	5.0 O	5.0 O	5.0 O	5.0 S	4.9 S	5.0 O	5.0 O	5.0 S
B0324-25	3.4 L	3.9 S	4.7 O	3.5 S	4.0 VL	3.9 S	4.6 S	3.7 M
B0329-1	4.8 L	4.3 S	5.0 O	4.4 S	4.6 VL	4.7 M	5.0 S	4.2 M
B0338-2	4.6 S	4.7 Q	5.0 O	4.9 S	4.2 S	4.6 S	5.0 O	5.0 S
B0339-1	3.9 L	4.0 S	4.4 O	4.1 S	3.8 S	3.6 S	4.4 S	4.3 S
B0348-2	5.0 L	5.0 M	5.0 S	4.9 M	4.7 VL	4.9 M	5.0 S	4.8 L
B0362-2	2.6 L	3.5 S	3.8 O	2.9 M	2.8 VL	3.1 S	4.1 O	2.8 M
B0427-7	3.5 M	4.2 S	4.4 O	3.6 S	3.7 L	4.0 M	4.5 S	3.6 S
B9922-11	4.1 S	3.8 S	4.7 O	3.7 S	4.0 M	3.9 S	4.8 O	3.8 S
Coastal Russet	4.6 M	4.4 S	5.0 O	4.6 M	4.6 L	4.6 S	5.0 O	4.6 M
Russet Burbank	4.2 O	4.4 O	4.8 O	4.2 S	4.4 S	4.1 O	4.8 O	4.4 S

⁴Fry 1-3 = Satisfactory

⁵See Table 1

BARC Table 7. Yield, tuber size distribution, and quality characteristics of russets top-killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects		
	CWT/A	%Mkt	<2 oz	2-6 oz	6-10 oz	10-16 oz	>16 oz	SG ¹	HH ²	HN ³
B0455-27	364	91	3.4	39.8	28.1	23.3	5.4	76	4	0
B0455-8	361	88	2.2	30.7	33.3	24.4	9.4	78	2	0
B0478-25	327	87	3.2	32.4	32.6	22.0	9.9	85	0	0
B0493-8	362	85	1.0	21.0	30.8	33.0	14.3	80	2	0
B0524-9	315	92	2.4	41.9	30.4	20.0	5.3	79	7	0
B0647-1	313	89	3.3	31.7	38.8	18.5	7.8	72	8	0
B0649-5	287	85	1.9	26.5	32.1	26.5	13.1	74	9	0
B0668-23	280	93	5.4	58.9	26.0	8.5	1.3	75	0	0
B0671-19	355	94	2.1	40.8	30.6	22.2	4.3	74	5	9
B0672-9	328	91	4.1	38.4	26.2	26.2	5.1	77	4	0
B0683-3	308	91	2.2	28.3	31.9	31.2	6.5	76	6	0
B0742-1	246	88	11.7	61.6	23.5	3.2	0.0	80	2	0
B0745-14	323	97	3.0	46.2	34.9	15.4	0.5	81	2	0
B0745-6	323	89	3.3	33.9	34.0	20.8	7.9	91	5	0
B0835-4	312	89	4.2	37.2	26.4	25.2	6.9	67	15	0
B0835-7	239	91	8.1	64.3	19.5	7.5	0.6	78	3	0
Nemarus	303	73	1.4	18.2	18.3	36.1	26.0	71	3	0
Russet	365	91	4.0	39.6	32.4	19.2	4.7	82	12	0
Burbank										
LSD (.05)	60							05		

¹ 1.0 omitted

² Number of tubers with hollow heart

³ Number of tubers with internal necrosis

BARC Table 7 (continued)

Temperature Date	50°F 1/13	45°F 1/19	40°F 1/13	40°-70°F 1/27	50°F 2/3	45°F 2/3	40°F 2/5	40°-70°F 2/24
Pedigree	Fry ⁴ Spt ⁵	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt	Fry Spt
B0455-27	4.9 S	4.8 S	5.0 O	4.9 S	4.8 S	4.9 S	5.0 O	4.5 S
B0455-8	4.2 O	4.5 O	5.0 O	4.7 S	4.6 S	4.3 S	5.0 O	4.7 S
B0478-25	4.2 M	4.1 S	4.3 O	3.9 S	4.3 L	4.2 M	4.5 O	4.0 S
B0493-8	5.0 VL	4.6 M	5.0 O	4.9 M	4.7 VL	4.9 L	5.0 S	4.7 L
B0524-9	3.5 M	3.9 M	4.2 S	3.7 S	3.9 L	4.2 M	4.6 S	4.1 S
B0647-1	3.5 S	4.1 S	4.5 O	3.7 M	3.9 S	4.1 S	4.9 S	4.2 M
B0649-5	4.1 S	4.1 O	5.0 O	4.2 S	4.1 S	4.2 S	5.0 O	4.1 S
B0668-23	3.9 S	3.9 S	4.9 O	4.1 S	3.9 S	4.1 S	4.9 O	4.2 S
B0671-19	4.4 VL	4.6 L	4.9 S	4.7 L	4.6 VL	4.5 VL	5.0 S	4.4 L
B0672-9	3.4 S	4.0 S	4.3 O	3.9 M	4.2 S	4.1 S	4.7 S	3.9 M
B0683-3	3.6 O	4.1 O	4.5 O	3.5 S	4.0 S	4.0 O	4.8 O	3.8 S
B0742-1	3.3 S	3.6 S	3.9 O	3.7 S	3.8 M	3.7 S	4.3 O	3.7 M
B0745-14	3.7 S	4.2 S	4.9 O	4.0 S	4.3 M	4.3 S	4.8 O	4.7 S
B0745-6	2.8 M	3.3 S	4.2 O	2.7 S	3.0 M	2.8 S	4.0 S	3.1 S
B0835-4	4.7 S	4.6 O	5.0 O	5.0 S	4.6 S	4.8 S	5.0 O	5.0 S
B0835-7	3.6 O	4.0 O	4.8 O	3.7 O	3.8 S	4.0 O	4.6 O	4.4 S
Nemarus	4.2 S	4.2 S	5.0 O	4.0 S	4.2 M	4.4 S	5.0 O	4.6 S
Russet Burbank	4.5 O	4.2 O	4.5 O	4.0 S	4.4 O	4.3 O	4.7 O	4.0 S

^{4,5}See Table 6

BARC Table 8. Yield, tuber size distribution, and quality characteristics of specialty market potatoes top-killed 123 days after planting at Echo Lake in 1992.

Pedigree	Mkt		% Tuber Size Distribution					Internal Defects		
	CWT/A	%Mkt	<17/8"	17/8-2 1/4"	2 1/4-3 1/4"	3 1/4-4"	>4"	SG ¹	HH ²	HN ³
B0615-1	403	97	3.0	21.3	61.8	13.9	0.0	66	1	0
B0615-2	411	94	4.8	28.6	52.8	12.7	1.1	74	7	0
B0616-1	402	94	4.4	26.7	52.8	15.0	1.1	77	3	0
B0800-12	337	92	7.0	35.7	50.6	6.2	0.6	81	4	0
B0806-13	378	93	2.2	16.3	51.5	25.5	4.4	69	2	0
B0808-3	372	94	6.4	39.1	45.8	8.6	0.0	82	10	0
B0808-4	365	91	8.6	38.6	43.7	8.6	0.5	82	11	4
B0811-13	421	90	3.4	22.3	52.5	15.4	6.5	73	5	0
B0811-2	448	95	5.1	27.3	54.5	12.7	0.3	79	3	0
B0850-4	297	93	6.9	39.5	45.6	8.0	0.0	73	0	0
B0850-5	277	85	14.9	35.2	45.9	4.0	0.0	68	1	0
B0852-5	409	91	9.4	43.6	43.6	3.5	0.0	68	0	0
B0852-7	375	93	5.7	24.7	55.3	12.6	1.7	77	5	0
B0903-2	467	87	2.7	15.4	45.0	27.0	9.9	78	2	0
B0918-5	318	95	4.3	20.6	53.7	20.4	1.0	77	0	1
LaRouge	408	95	4.6	24.5	62.6	7.9	0.3	70	12	0
Red LaSoda	450	95	4.1	26.5	57.2	10.9	1.3	71	11	0
Reddale	385	86	2.4	10.5	46.3	28.9	11.9	68	19	0
LSD (.05)	56							06		

^{1, 2, 3} See Table 1

BARC Table 8 (continued)

Temperature Date	50°F 1/12		45°F 1/19		40°F 1/20		40°-70°F 1/26		Comments
	Chip ⁴	Spt ⁵	Chip	Spt	Chip	Spt	Chip	Spt	
Pedigree									
B0615-1	9.1	L	9.2	M	10.0	S	8.9	M	Red skin
B0615-2	9.5	S	9.4	S	9.9	O	9.7	S	Red skin
B0616-1	10.0	S	10.0	O	10.0	O	9.9	S	Red skin
B0800-12	8.3	S	8.7	S	9.3	O	8.5	S	Red skin
B0806-13	7.3	L	8.0	L	8.5	S	8.4	M	Red skin, yellow flesh
B0808-3	8.9	M	9.7	S	10.0	O	9.4	S	Red skin, yellow flesh
B0808-4	9.5	S	9.7	S	9.9	O	9.7	S	Red skin, yellow flesh
B0811-13	9.4	S	9.6	O	10.0	O	9.9	S	Red skin, yellow flesh
B0811-2	9.8	S	9.9	S	10.0	O	9.8	S	Red skin, yellow flesh
B0850-4	9.3	S	9.4	S	9.8	O	9.5	S	Red skin
B0850-5	8.1	S	9.1	S	9.8	O	9.1	S	Red skin
B0852-5	9.9	S	9.9	S	9.9	O	9.9	S	Purple skin
B0852-7	9.7	M	9.5	S	10.0	O	9.7	S	Purple skin
B0903-2	9.6	L	9.7	M	9.9	O	9.9	M	Purple skin
B0918-5	7.6	VL	8.1	M	8.9	O	7.5	M	Purple skin
LaRouge	9.7	S	9.9	S	10.0	O	9.6	S	
Red LaSoda	9.9	S	10.0	S	10.0	O	10.0	S	
Reddale	10.0	S	10.0	S	10.0	O	9.9	S	

^{4,5}See Table 1

BARC Table 9. Yield, processing characteristics, and late blight foliar symptoms of late blight resistant selections harvested 135 days after planting on Aroostook Farm in 1992.

Pedigree	Mkt		SG ¹	Chip ²	Spt ³	LB ⁴
	CWT/A	% Mkt				
Atzimba	288	84	72	9.0	M	9.0 a
B0288-17	185	94	86	7.7	S	9.0 a
Sebago	493	93	70	8.8	S	9.0 a
Kennebec	582	88	71	8.0	S	9.0 a
B0807-3	472	88	71	8.5	S	8.6 a-b
B0793-1	626	90	87	9.6	S	7.8 a-c
B0702-1F	594	95	78	9.4	M	7.0 a-d
B0748-1F	110	56	84	9.8	O	7.0 a-d
B0690-5	636	89	92	9.7	M	6.8 a-e
B0818-2	276	91	72	9.5	S	6.7 a-e
B0727-1	621	96	101	9.8	S	6.4 a-f
B0801-1	528	93	77	10.0	O	6.3 b-g
B0718-9	467	88	66	7.9	M	6.2 b-h
B0690-6	322	85	86	10.0	O	6.0 b-h
B0747-3	496	94	86	9.5	S	5.9 b-h
B0750-2	372	90	92	7.5	O	5.6 c-h
B0692-4	386	87	86	8.7	M	5.5 c-h
B0718-8	623	90	76	8.2	S	5.2 c-h
B0793-2	580	96	76	10.0	S	5.1 c-h
B0750-1	504	83	86	9.4	S	4.9 d-h
B0767-1	189	87	80	9.6	S	4.8 d-h
B0795-1	436	73	75	10.0	S	4.5 d-h
B0711-1	363	85	81	7.7	S	4.5 d-h
B0767-2F	327	81	83	10.0	S	4.4 d-h
PI383470B	807	87	71	9.5	S	4.2 e-h
B0300-6	379	82	76	9.6	S	4.1 e-h
B0793-4	476	90	83	10.0	S	4.1 e-h
B0718-3	524	93	79	10.0	O	4.1 e-h
B0807-2	217	81	65	10.0	S	4.0 e-h
B0752-1	248	81	87	9.5	S	3.8 f-h
B0801-2	512	95	75	10.0	S	3.5 g-h
B0767-2	632	83	89	9.6	S	3.4 h

¹ 1.0 omitted

^{2,3} See Table 1

⁴ Late blight foliar symptoms; 1 = no symptoms ... 9 = completely dead

Mean separation by Duncan's multiple range test, $P = 0.05$. Values are means of two replications with eight plants per replication.

BARC Table 10. Ratings of 25 lines for resistance to scab, *Streptomyces scabies*.

Pedigree	LJ ¹	AI ²	LAI ³
B0178-34	0.97	0.92	0.89
B0256-1	.96	.88	.85
B0257-12	.96	.89	.87
B0257-3	.95	.85	.82
B0257-9	.72	.60	.49
B0306-6	.83	.82	.72
B0311-2	.60	.51	.40
B0312-10	.94	.76	.72
B0316-19	.86	.61	.55
B0324-25	.80	.77	.64
B0329-1	.91	.66	.62
B0339-1	.14	.19	.08
B0348-2	.30	.21	.14
B0362-2	.70	.61	.48
B0427-7	.82	.74	.64
B0455-8	.80	.71	.59
B0493-8	.91	.80	.78
B0615-2	.73	.56	.41
B0616-1	.57	.38	.29
B0809-10	.84	.66	.58
B0813-7	.97	.91	.89
B9922-11	.72	.64	.51
Green Mountain	.89	.92	.84
Russet Burbank	.81	.75	.63
Superior	.87	.58	.51

¹ Lesion index

² Surface area covered index

³ Overall scab index

1992 NORTH CENTRAL REGIONAL POTATO TRIALS

R.H. Johansen, North Dakota State University
and Cooperators^{1/}

This year marked the 42nd year the North Central Regional Trials have been conducted. There are 10 states and three provinces in the trial. Louisiana again lost their trial due to flooding and poor weather conditions.

Cultivars Recently Released:

In 1992, North Dakota released the cultivar, Goldrush, (Selection No. ND1538-1Russ), whose parentage was ND450-3 x Lemhi.

Cooperating States and Provinces:

State or Province	Date Planted	Date Harvested	Total Days to Harvest
Manitoba	5/25	9/12	110
Ontario	5/5	9/14	133
Alberta	6/2	9/25	115
Indiana	4/7	7/28	113
Iowa	4/16	7/23	99
Louisiana	Trial was lost due to flooding.		
Michigan	5/6	9/12	132
Minnesota	4/17	7/17	154
Nebraska	5/26	9/23	120
North Dakota	5/18	9/21	117
Ohio	5/20	9/15	119
South Dakota	5/1	9/3	126
Wisconsin	4/28	9/16	142

Environmental Conditions: Soil type ranged from clay loam to sand; however, most trials were grown on lighter sandy loam. Some trials were irrigated.

Cultural Practices: Fertilizers, insecticides, herbicides, vine killers, etc. were all based on local conditions. Some of the insecticides and fungicides used were Metribuzin, Endosulfan, Sethoxydim, Deltamethrin, Chlorothalonil, Trident, Bravo, Decis, Guthion, Polyram, Thiodan, Ridomil, Difolatan, Furadan, Dithane M-45, Sevin, Thimet, Pounce, Mocap, Phorate, Imidan, M-Trak, Monitor, Cygon, Penncozeb, Kocide, Disyston, Asana. Herbicides used were Sencor, Dual, Poast, Ambush, Turbo. Vine Killers used were Diquat, Reglone and mechanical.

Weather Conditions: The weather was relatively cool and wet in the northern tier of states. This included Nebraska where rainfall was above normal and

temperature below normal. Michigan had frost in May and June. For the most part, relatively ideal conditions prevailed in 1992 and this can be reflected by the increase in yield over 1991.

Entries: Entries were received from Minnesota, Wisconsin, Louisiana and North Dakota. Check varieties supplied by North Dakota were Norchip, Norland, Norgold Russet M, Russet Burbank and Red Pontiac.

Total and US No. 1 Yield: In total yield, Red Pontiac produced the highest average yield, however, LA12-59 was similar or higher than Red Pontiac in U.S. No. 1 yield. Other high yielding entries were ND1871-3R and MN12823. MN14489 was the lowest yielding entry. Minnesota and Wisconsin again produced the highest yields (North Central Regional Trial Tables 1 and 2).

Percent U.S. No. 1: Russet Burbank again had the lowest percent US No. 1. All other entries were quite similar ranging from 76% to 87% (North Central Regional Trial Table 3).

Maturity: Norland was the earliest maturing entry while Russet Burbank and MN12823 were the latest maturing (North Central Regional Trial Table 4).

Percent Total Solids: As shown in North Central Regional Trial Table 5, Wisc. 887 and Wisc. 870 produced the highest total solids. Red Pontiac and Norland produced the lowest total solids. The two red selections, ND1871-3R and LA12-59, were higher in solids than the two red check selections, Norland and Red Pontiac.

^{1/} Alberta, Mr. Clive Schaupmeyer; Manitoba, Mr. Brian Rex; Ontario, S.T. Ali Khan; Indiana, Dr. Hommer Erickson; Iowa, Dr. Bill Summers; Louisiana, Dr. William Young; Michigan, Dr. Richard Chase and Dr. Dave Douches; Minnesota, Dr. Florian Lauer; Nebraska, Dr. Alexander D. Pavlista; Ohio, Dr. Mark A. Bennett; South Dakota, Dr. Paul Prashar; Wisconsin, Dr. Stan Peloquin, Dr. Dave Curwen, Mr. Brian Bowen.

Scab Reaction: Minnesota and Indiana had the highest incidence of scab. Scab seemed to be more prevalent in MN12823, ND2224-5R, Wisc. 1100R, Red Pontiac and Wisc. 870 (North Central Regional Trial Table 6).

Summary of Grade Defects: Grade defects are found in North Central Regional Trial Table 7. Nebraska had the most scab, while Indiana and Ohio had the most second growth. Ohio and Alberta had the most hollow heart. Fifty-six percent of the Russet Burbanks were hollow in Alberta. Alberta and Michigan had severe vascular discoloration. Several entries are starred to indicate their weakness and breeders should take note.

Chip Color: Wisc. 870, Wisc. 887, MN12823 and Norchip appeared to be the best chippers. Chip color is found in North Central Regional Trial Table 8 and is reported either in Agtron or PCII Color Chart. Three locations again did not report chip data.

Early Blight: No table is presented for early blight as only North Dakota presented data. Probably this characteristic should be eliminated from the trial in the future.

Overall Merit Ratings: Merit ratings are reported in North Central Regional Trial Table 9. The following summary shows only the top five entries and also indicates the performance or ratings for these entries over the past three years.

Total Points			
Selection	1990	1991	1992
1. ND1871-3R	-0-	21	32
2. LA12-59	32	16	30
3. MN12823	-0-	-0-	25
4. ND2224-5R	-0-	-0-	22
5. Wisc. 887	5	13	19

North Central Regional Trial Table 1. Total Yield (Cwt./Acre) - 1992.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	ND	OH	SD	WI	Ave.
Early to Medium Early													
MN14489	316	209	337	245	288	219	514	251	160	201	274	495	292
Norland	309	191	313	318	291	209	576	399	209	381	232	416	320
Norgold Russet M	336	236	308	287	268	272	634	409	254	363	318	480	347
Norchip	322	206	314	271	264	237	616	336	265	329	281	520	330
Medium Late to Late													
MN12823	343	281	337	362	276	518	557	469	266	322	423	552	392
ND1871-3R	352	295	310	260	266	351	617	372	268	428	403	608	378
ND2224-5R	349	197	313	241	342	256	550	310	213	370	221	578	328
LA12-59	332	239	377	405	354	416	621	319	271	407	423	515	390
Wisc. 870	252	176	215	336	245	299	459	253	142	297	312	495	290
Wisc. 887	310	258	226	349	241	396	431	^{Rooted} 344	186	185	407	523	319
Wisc. 1100R	301	199	292	234	321	382	658	344	231	389	397	536	357
Red Pontiac	380	308	383	401	276	429	636	447	308	424	378	628	417
Russet Burbank	329	279	310	259	281	302	625	315	219	342	405	616	357
Average	325	237	310	305	214	330	576	352	230	341	344	540	

North Central Regional Trial Table 2. US No. 1 Yield (Cwt/Acre) - 1992.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	ND	OH	SD	WI	Ave.
Early to Medium Early													
MN14489	242	172	294	203	237	185	467	216	147	135	254	413	247
Norland	233	170	221	302	259	171	546	375	189	328	220	346	280
Norgold Russet M	182	196	200	253	218	202	601	348	207	203	281	380	273
Norchip	212	181	212	190	217	186	569	316	221	237	256	417	268
Medium Late to Late													
MN12823	311	199	276	308	235	465	532	394	189	225	412	440	332
ND1871-3R	270	251	231	192	216	322	581	353	244	342	370	546	327
ND2224-5R	225	167	206	193	293	217	506	291	200	315	203	493	276
LA12-59	251	196	294	340	314	372	552	297	227	322	387	492	337
Wisc. 870	156	154	136	289	202	252	434	238	115	255	278	440	246
Wisc. 887	255	205	184	304	195	376	418	Rotted	162	159	387	484	284
Wisc. 1100R	143	166	150	150	270	255	599		194	323	336	457	279
Red Pontiac	337	207	313	373	233	384	590	353	206	267	350	421	336
Russet Burbank	193	219	171	166	143	217	576	302	161	144	319	472	257
Average	232	191	222	251	175	277	536	316	189	251	312	442	

North Central Regional Trial Table 3. Average Percent US No. 1 (over 2" diameter) - 1992.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	ND	OH	SD	WI	Ave.
Early to Medium Early													
MN14489	76	82	87	83	82	84	91	86	92	67	93	83	84
Norland	76	89	71	95	89	82	95	94	90	86	95	84	87
Norgold Russet M	54	83	65	88	81	77	93	85	81	56	88	79	78
Norchip	66	88	67	70	82	78	92	94	84	72	92	80	80
Medium Late to Late													
MN12823	91	71	82	85	85	90	95	84	71	70	97	80	76
ND1871-3R	77	85	75	74	81	92	94	95	91	80	92	89	85
ND2224-5R	64	85	66	80	86	84	92	94	94	85	92	85	84
LA12-59	76	82	78	84	89	89	89	93	84	79	91	86	85
Wisc. 870	62	87	63	86	82	85	94	94	81	86	89	89	83
Wisc. 887	82	79	81	87	81	95	97	^{Rotted}	87	86	95	93	88
Wisc. 1100R	48	84	51	64	84	67	91	89	84	83	85	85	76
Red Pontiac	89	67	82	93	84	89	93	79	67	63	93	67	78
Russet Burbank	58	79	57	64	51	71	92	96	74	42	79	76	70
Average	71	82	72	81	61	84	93	90	83	73	91	85	

North Central Regional Trial Table 4. Maturity Classification^{1/} - 1992.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	ND	OH	SD	WI	Ave.
Early to Medium Early													
MN14489	3.8	3.0	3.3	3.0	3.0	1.0	2.0	ND ^{2/}	3.0	NA ^{3/}	3.0	3.0	2.8
Norland	2.5	1.0	2.4	1.0	1.0	1.0	1.0	ND	2.0	NA	1.0	1.0	1.4
Norgold Russet M	3.3	3.0	2.8	4.8	3.0	1.0	3.0	ND	3.8	NA	3.0	3.0	3.1
Norchip	3.5	3.0	3.0	3.0	2.0	1.0	2.0	ND	2.8	NA	4.0	2.0	2.6
Medium Late to Late													
MN12823	4.8	4.0	4.0	4.8	4.0	3.0	5.0	ND	5.0	NA	3.0	4.0	4.2
ND1871-3R	4.5	4.0	3.4	2.8	4.0	2.0	4.0	ND	3.8	NA	2.0	4.0	3.5
ND2224-5R	3.3	3.5	2.8	2.0	4.0	1.0	2.0	ND	2.0	NA	4.0	4.0	2.9
LA12-59	4.5	4.0	3.0	2.5	4.0	2.0	3.0	ND	3.0	NA	2.0	4.0	3.2
Wisc. 870	3.8	4.0	3.1	3.2	4.0	1.0	4.0	ND	3.3	NA	2.0	4.0	3.2
Wisc. 887	4.3	3.5	3.0	4.2	4.0	2.0	4.0	ND	4.0	NA	3.0	5.0	3.7
Wisc. 1100R	3.3	4.0	2.8	2.0	4.0	1.0	2.0	ND	3.0	NA	4.0	4.0	3.0
Red Pontiac	4.5	4.0	3.5	3.8	3.0	2.0	3.0	ND	4.0	NA	3.0	4.0	3.5
Russet Burbank	4.8	5.0	4.0	5.0	5.0	1.0	5.0	ND	5.0	NA	4.0	5.0	4.4
Average	3.9	3.5	3.2	3.2	3.0	1.5	3.1	--	3.4	--	2.9	3.6	

1/ 1. Very Early - Norland Maturity 4. Late - Katahdin Maturity 2/ ND - No data reported.
 2. Early - Irish Cobbler Maturity 5. Very Late - Russet Burbank Maturity 3/ NA - Not Applicable
 3. Medium - Red Pontiac Maturity

North Central Regional Trial Table 5. Percent Total Solids - 1992.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	ND	OH	SD	WI	Ave.
Early to Medium Early													
MN14489	19.4	18.3	19.9	15.0	16.5	17.7	17.8	18.4	19.4	18.3	19.2	17.3	18.1
Norland	19.9	18.1	19.0	14.4	15.7	15.8	16.2	16.5	18.4	19.0	18.2	16.5	17.3
Norgold Russet M	22.0	19.8	21.3	14.4	16.9	16.6	18.2	18.0	17.7	18.5	19.7	18.6	18.5
Norchip	22.7	23.4	22.0	17.2	18.6	18.7	19.9	20.1	20.7	14.9	21.7	20.3	20.0
Medium Late to Late													
MN12823	21.6	21.9	20.3	15.8	18.2	18.9	19.9	20.3	20.1	14.9	22.4	18.6	19.4
ND1871-3R	20.3	20.0	30.5	14.5	16.2	17.7	16.8	18.8	19.2	17.9	19.2	17.5	19.1
ND2224-5R	20.4	17.9	20.3	14.3	14.7	16.2	16.1	17.1	18.2	20.0	18.6	17.3	17.6
LA12-59	22.3	23.8	22.5	16.1	19.0	19.2	20.7	19.1	20.9	22.3	21.2	20.9	20.7
Wisc. 870	25.2	26.7	23.8	18.9	20.4	21.3	22.4	21.6	23.3	23.0	23.6	23.5	22.8
Wisc. 887	24.8	26.7	22.3	18.0	20.8	22.3	23.3	^{Rooted} 24.2	24.2	21.9	23.8	23.5	22.9
Wisc. 1100R	19.7	20.2	20.0	15.0	16.3	16.4	17.7	17.1	18.6	18.1	18.4	17.1	17.9
Red Pontiac	18.9	18.5	19.8	14.3	14.8	16.4	17.6	17.7	18.0	15.6	18.6	16.7	17.2
Russet Burbank	22.0	23.2	20.8	7.1	18.8	19.8	22.5	19.9	20.7	24.2	21.8	21.4	20.2
Average	21.5	21.4	21.7	15.8	17.5	18.2	19.2	18.8	20.0	19.1	20.5	19.2	

North Central Regional Trial Table 6. Scab Reaction Report. Most Representative Scab
(Area Type)^{1/} - 1992.

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	ND	OH	SD	WI
Early to Medium Early												
MN14489	0-0	T-1	ND ^{2/}	0-0	0-0	0-0	3-2	T-1	T-1	0-0	ND	ND
Norland	1-1	T-1	ND	0-0	0-0	0-0	3-2	T-1	T-1	T-1	ND	ND
Norgold Russet M	0-0	T-1	ND	0-0	T-1	0-0	1-1	T-1	0-0	0-0	ND	ND
Norchip	T-1	T-1	ND	2-2	T-1	T-3	2-2	T-1	2-1	0-0	ND	ND
Medium Late to Late												
MN12823	T-1	T-1	ND	2-1	T-1	0-0	3-2	T-4	1-1	0-0	ND	ND
ND1871-3R	0-0	T-2	ND	0-0	T-1	0-0	2-2	T-1	T-1	0-0	ND	ND
ND2224-5R	T-1	T-1	ND	3-2	0-0	T-3	3-3	1-5	T-1	0-0	ND	ND
LA12-59	T-1	T-1	ND	3-1	1-2	0-0	2-2	T-1	T-1	0-0	ND	ND
Wisc. 870	0-0	T-1	MD	3-1	T-5	0-0	2-3	T-4	2-1	0-0	ND	ND
Wisc. 877	T-1	T-2	ND	2-1	1-2	1-4	2-2	not harv.	1-1	T-5	ND	ND
Wisc. 1100R	0-0	T-1	ND	0-0	T-1	0-0	4-5	T-4	T-1	T-5	ND	ND
Red Pontiac	1-1	T-1	ND	0-0	1-2	0-0	4-5	T-3	1-1	0-0	ND	ND
Russet Burbank	0-0	T-1	ND	0-0	T-1	0-0	2-2	0-0	0-0	0-0	ND	ND

^{1/} AREA

- T = less than 1 %
1 = 1-20 %
2 = 21-40 %
3 = 41-60 %
4 = 61-80 %
5 = 81-100 %

TYPE

- 1 = Small, superficial
2 = Larger, superficial
3 = Larger, rough pustules
4 = Larger pustules, shallow eyes
5 = Very large pustules, deep holes

^{2/}ND - No data reported

North Central Regional Trial Table 7. Summary of Grade Defects - 1992.

Cultivar or Selection	External					Internal				
	Scab	Growth Cracks	Off Shape and Second Growth	Tuber Rot	Sun Green	Total Free of External Defects ^{1/}	Hollow Heart	Internal Necrosis	Vascular Discolor ation	Total Free of Int. Def. ^{1/}
Early to Medium Early										
MN14489	2.5	.8	4.8	2.1	5.1	85.5	2.4	1.4	15.1*	81.2
Norland	4.4	4.2	1.8	.6	1.2	88.2	3.4	.7	3.4	92.7
Norgold Russet M	2.0	1.2	9.0*	.2	2.4	85.8	7.25*	1.0	7.2	84.7
Norchip	5.4	3.0	4.0	1.3	4.3	83.9	2.0	.5	10.7	87.0
Medium Late to Late										
MN12823	8.4	.3	5.9	2.2	7.3*	78.6	3.4	1.3	7.7	87.6
NND1871-3R	5.2	.7	7.4	2.5	1.4	83.1	2.5	.4	12.0	85.2
NND2224-5R	10.3*	1.6	.6	1.4	1.2	85.2	.5	.1	7.7	91.7
LA12-59	4.6	1.2	2.3	.2	1.1	91.0	1.4	0.0	7.6	91.0
Wisc. 870	6.7	.3	2.8	1.1	4.4	85.0	3.7	.4	7.4	88.5
Wisc. 887	9.7	.5	2.3	.6	1.2	85.5	2.5	1.8	8.6	87.2
Wisc. 1100R	4.5	.4	1.7	.6	.6	92.3	.1	.6	12.4	87.6
Red Pontiac	13.7*	1.1	6.0	.5	3.0	76.0	5.8	.3	7.7	86.1
Russet Burbank	1.9	1.6	24.4*	.1	1.6	70.2	8.3*	.3	7.2	87.9
Average	6.1	1.3	5.6	1.0	2.7	83.9	3.3	.7	8.8	87.6

^{1/}Percent normal tubers showing no defects (some individuals had more than one type of defect).

*Possible weakness of cultivar or clone.

North Central Regional Trial Table 8. Chip Color - 1992.

Cultivar or Selection	Man. ¹	Ont. ¹	Alb. ¹	IN ²	IA ³	MI ¹	MN ³	NE ¹	ND ¹	OH ²	SD ³	WI ²
Early to Medium Early												
MN14489	20.0	53.1	25.0	5.0	ND	56.6	ND	51.2	38.0	5.0	ND	3.5
Norland	19.0	58.2	20.0	4.0	ND	50.8	ND	46.9	35.0	3.0	ND	5.3
Norgold Russet M	16.0	40.7	16.0	5.0	ND	41.1	ND	29.1	17.0	5.0	ND	7.5
Norchip	25.0	61.0	40.0	3.0	ND	47.8	ND	61.9	43.0	4.0	ND	3.5
Medium Late to Late												
MN12823	28.0	63.1	33.0	2.0	ND	54.1	ND	61.3	37.0	5.0	ND	3.0
ND1871-3R	12.0	49.4	17.0	5.0	ND	46.5	ND	48.0	21.0	4.0	ND	7.0
ND2224-5R	15.0	61.2	21.0	4.0	ND	50.7	ND	56.7	27.0	5.0	ND	5.5
LA12-59	21.0	59.6	28.0	4.0	ND	56.7	ND	58.8	32.0	4.0	ND	3.3
Wisc. 870	28.0	65.5	43.0	4.0	ND	57.6	ND	69.2	40.0	5.0	ND	2.5
Wisc. 887	26.0	65.0	45.0	3.0	ND	56.5	ND	^{Rooted}	40.0	4.0	ND	2.5
Wisc. 1100R	26.0	63.4	32.0	3.0	ND	--	ND	54.0	33.0	4.0	ND	3.8
Red Pontiac	14.0	36.7	15.0	5.0	ND	41.2	ND	39.7	19.0	4.0	ND	7.5
Russet Burbank	23.0	51.7	29.0	5.0	ND	51.2	ND	47.5	29.0	5.0	ND	4.8
Average	21.0	56.0	28.0	4.0	--	50.9	--	52.0	31.6	4.4	--	4.6

^{1/} Agron (Highest number lightest)

^{2/} PCI Color Chart (1 = lightest; 10 = darkest)

^{3/} No Data

North Central Regional Trial Table 9. General Merit Ratings - 1992.^{1/}

Cultivar or Selection	Man.	Ont.	Alb.	IN	IA	MI	MN	NE	ND	OH	SD	WI	Total Points
Early to Medium Early													
MN14489				1									1
Norland					1			5		1			7
Norgold Russet M								4	2				6
Norchip	1	2					3	3					9
Medium Late to Late													
MN12823	5	5		2	3		4				5	1	25
ND1871-3R	4	4	5						5	5	4	5	32
ND2224-5R			3		5	5	2		4	3			22
LA12-59	1		4	3	4	4	5	2	1	2	2	2	30
Wisc. 870				4		3	1	1				4	13
Wisc. 887	3	3		5		2					3	3	19
Wisc. 1100R					2				3	4	1		10
Red Pontiac	2	2	1			1							6
Russet Burbank													0
^{1/} Merit Ratings													
1.	ND1871-3R - 32 points				1								
2.	LA12-59 - 30 points					5							
3.	MN12823 - 25 points					2	4						
4.	ND2224-5R - 22 points					3	3						
5.	Wisc. 887 - 19 points					4	2						
						5	1						

WESTERN REGIONAL POTATO VARIETY TRIAL - 1992

J. J. Pavék, D. L. Corsini, and Cooperators^{1/}

Uniform Potato Yield Trial

The 1992 trial was again grown at twelve locations for yield and at two for disease data. Twenty-one entries, 16 experimental, two standard checks, two early checks and one red check, were grown. Three locations grew entries for both early and late harvest. The trial locations, dates of planting, vine killing, and harvest, and days from planting to vine-kill/harvest are shown below.

Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local conditions. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. The more northern locations had warmer than normal early- and mid-season temperatures.

Data on vines, tubers, yield, internal quality, disease reactions, merit scores, and disposition are presented in Western Tables 1 through 7. After three years in the trial, dual-purpose russet COO83008-1 and fresh-market russet CO82142-4 will undergo increase and testing on a commercial scale. Three russets, A74212-1E, ATX84378-1RU, and NDO2904-7, continue in the trial as fresh-market entries. Six dual-purpose russets will also be continued.

^{1/}California, R. Voss, K. Brittan; Colorado, D. Holm; Idaho, S. Love, G. Kleinkopf; New Mexico, N. Christensen, E.J. Gregory; Oregon, A. Mosley, D. Hane, K. Rykbost, C. Stanger, S. James; Texas, D. Smallwood, J. C. Miller; Washington, R. Thornton, M. Martin, L. Mikitzel, C. Brown.

State	Location	Planting Date	Vine-Kill Date	Harvest Date	Days to Vine-Kill/ Harvest
California	Kern Co.	2/11	6/8	6/15	117
"	Tulelake	5/7	9/14	9/21	130
Colorado	San Luis Vly	5/15	---	9/24	132
Idaho	Aberdeen	4/28	8/23	9/15	117
"	Kimberly-Early	4/23	8/7	8/14	106
"	Kimberly-Late	4/23	9/18	10/1	148
New Mexico	Clovis	3/27	7/24	7/29	119
"	Farmington	4/16	---	9/10	147
Oregon	Hermiston-Early	3/27	7/16	8/6	111
"	Hermiston-Late	4/23	9/26	10/7	156
"	Klamath Fls	5/18	9/10	9/25	115
"	Malheur	4/30	---	9/30	153
Texas	Springlake	4/3	7/15	7/27	103
Washington	Othello - Early	4/2	7/24	8/12	113
"	Othello - Late	4/13	9/11	9/23	151
"	Prosser (Disease Data Only)				

Western Table 1. 1992 Seed source, stand, tuber and vine characteristics, and foliar and tuber diseases. 1/

Entry	Seed Source	Stand (10 loc)	TUBERS		Vine		Vert.	E. Blight		Scab	Leaf-roll
			Shape	Skin	Size	Mat		Fol	Tuber		
A74212-1E	OR	96	O	RUS	ML	ME	R	S	MS	MS/R	NN
A8174-2	ID	97	O	RUS	MS	E	S	S	MS	R	S
A81286-1	WA	94	O	RUS	ML	ML	R	MR	MS	R	MR
A81473-2	OR	96	O	RUS	L	L	VR	MR	MS	R	R
A81478-1	OR	97	L	RUS	ML	ML	MR	MR	MS	R	S
A82119-3	OR	93	O	RUS	ML	L	R	MR	MS	MR/R	R/MS
A8390-3	OR	93	O	RUS	M	ML	S	S	S	R	MR
AC75430-1	CO	97	O	RUS	ML	L	MS	MS	VR	R	R
AO83037-10	OR	93	O	RUS	M	M	MS	MS	R	R	S
AO84275-3	OR	95	O	RUS	ML	ML	MR	MS	MS	R	MR
ATX84378-1Ru	OR	93	O	RUS	M	ML	S	S	MS	R/MS	MR
CO82142-4	CO	93	O	RUS	M	ML	MS	S	S	MS/S	MR
COO83008-1	OR	94	L	RUS	M	M	MS	MS	MS	R/MS	MR
NDO2904-7	OR	94	L	RUS	M	ME	VS	VS	S	R/MR	MR/S
Lemhi Russet		96	L	RUS	ML	ML	MS	S	VR	R	MR
Russet Burbank		97	L	RUS	ML	ML	MS	S	R	R	S
Russet Norkotah		97	L	RUS	MS	E	VS	VS	R	R	R/S
Shepody		93	L	WHT	ML	M	MS	S	MR	S	MR/MS
A82705-1R	ID	90	R	RED	M	M	MR	S	R	MS/MR	R
NDTX8731-1R	OR	96	R	RED	MS	ME	S	S	--	MS	--
Red LaSoda		95	R	RED	ML	ML	MS	S	S	S	MR

1/ Shape: O = oblong, L = long, R = round; Vine size: S = small, M = medium, MS = medium small, ML = medium large, Lrg = large; Mat = maturity: E = early, M = medium, L = late, ME = medium early, ML = medium late; Disease reaction: R = resistant, S = susceptible, MR = moderately resistant, MS = moderately susceptible, VS = very susceptible; if two different reactions are shown, the first is for Aberdeen, the second for Prosser; Vert. = Verticillium, NN = net necrosis.

Western Table 2. 1992 Total tuber yield, cwt/acre. Full season and early harvest, early harvest in parentheses.

Entry	Calif		Colo	Idaho		NMex		Oregon			Texas		Wash	Overall
	Krn Tul		SLV	Ab	Kim	Clv	Frm	Hrm	Klm	Mal	Spr	Oth	Mean	
	(390)	953	541	599	609 (542)	442	554	---	575	917	(434)	1014	(464)	689 (462)
A74212-1E	(308)	530	434	374	420 (456)	387	288	417 (341)	379	548	(281)	560	(342)	434 (346)
A8174-2	(282)	688	509	550	688 (485)	403	516	798 (259)	545	612	(183)	756	(355)	607 (313)
A81286-1	(376)	660	503	467	590 (426)	319	468	782 (159)	596	673	(236)	794	(287)	585 (297)
A81473-2	(308)	531	407	413	449 (375)	341	490	600 (187)	428	525	(238)	553	(206)	474 (263)
A81478-1	(314)	689	490	513	583 (490)	472	484	755 (226)	498	582	(342)	830	(326)	590 (340)
A82119-3	(323)	612	465	379	399 (427)	419	509	467 (392)	463	590	(247)	612	(397)	492 (357)
A8390-3	(343)	704	451	460	499 (506)	409	485	781 (293)	522	581	(257)	768	(386)	566 (357)
AC75430-1	(400)	770	555	571	535 (526)	437	489	873 (307)	707	607	(216)	843	(365)	639 (363)
AO83037-10	(353)	670	526	522	411 (341)	447	470	671 (134)	421	571	(241)	750	(---)	546 (267)
AO84275-3	(441)	672	454	447	435 (403)	307	450	778 (293)	581	585	(303)	756	(376)	547 (363)
ATX84378-1Ru	(406)	565	436	344	460 (364)	315	435	---	492	605	(225)	658	(305)	479 (295)
CO82142-4	(353)	622	455	404	491 (380)	366	499	709 (256)	489	620	(231)	787	(257)	544 (295)
COO83008-1	(319)	644	473	373	376 (422)	393	414	---	422	627	(385)	731	(362)	495 (384)
NDO2904-7	(361)	798	466	433	476 (522)	503	592	836 (214)	426	567	(500)	649	(---)	575 (399)
Lemhi Russet	(374)	740	488	485	411 (434)	491	467	725 (323)	537	586	(376)	970	(415)	600 (384)
Russet Burbank	(270)	631	347	---	---	319	395	---	371	405	(229)	---	(260)	411 (290)
Russet Norkotah	(296)	512	521	---	(372)	408	---	---	---	---	(304)	---	(383)	480 (313)
Shepody	(370)	519	473	---	(506)	451	---	---	---	---	(327)	---	(465)	481 (381)
A82705-1R	(302)	688	454	---	(446)	438	361	---	588	726	(381)	742	(464)	571 (408)
NDTX8731-1R	(435)	873	512	---	(567)	441	---	---	---	---	(411)	---	(487)	609 (475)
Red LaSoda	(349)	670	474	458	490 (445)	405	470	707 (285)	502	607	(302)	751	(363)	568 (350)
Location Means														

Western Table 3. 1991 U.S. No. 1's, percent of total yield for locations; overall mean, percent and cwt/acre; early harvest in parentheses.

Entry	Calif		Colo	Idaho		NMex		Oregon			Texas	Wash	Mean		
	Krn	Tul	SLV	Ab	Kim	Clv1/	Frm	Hrm	Klm	Mal	Spr	Oth	%	cwt/A	
A74212-1E	(95) 96		87	92	90 (89)	75	91	---	(73)	90	89	(87)	81 (90)	88	609 399
A8174-2	(86) 72		85	72	65 (73)	64	88	68 (67)	83	84		(71)	76 (76)	76	328 257
A81286-1	(90) 84		80	81	91 (86)	81	89	73 (76)	90	81		(69)	70 (83)	81	494 258
A81473-2	(92) 83		86	89	88 (84)	84	91	86 (75)	93	90		(86)	80 (81)	87	507 251
A81478-1	(94) 93		87	92	93 (92)	84	95	93 (72)	92	85		(72)	82 (81)	90	425 221
A82119-3	(92) 91		90	85	88 (87)	77	82	85 (70)	89	83		(68)	77 (83)	85	498 274
A8390-3	(93) 90		77	85	82 (79)	85	89	79 (81)	89	88		(77)	87 (84)	85	420 297
AC75430-1	(94) 98		83	87	90 (88)	81	93	89 (80)	90	91		(79)	85 (83)	89	504 306
AO83037-10	(95) 93		91	89	86 (89)	81	94	80 (71)	94	82		(73)	75 (83)	86	550 304
AO84275-3	(96) 91		82	79	71 (70)	73	81	80 (56)	78	84		(45)	81 (---)	81	440 191
ATX84378-1Ru	(85) 79		85	87	77 (87)	81	95	83 (89)	89	86		(94)	85 (74)	85	463 310
CO82142-4	(90) 85		93	92	89 (85)	77	92	---	(81)	90		(87)	72 (80)	87	415 251
COO83008-1	(96) 91		86	91	85 (82)	73	91	84 (85)	94	85		(91)	82 (85)	86	469 260
NDO2904-7	(97) 96		85	88	81 (85)	78	91	---	(92)	94		(88)	88 (87)	89	440 343
Lemhi Russet	(92) 91		83	76	77 (80)	68	89	85 (73)	86	78		(86)	81 (---)	82	473 334
Russet Burbank	(76) 77		75	62	59 (61)	59	85	70 (58)	77	64		(76)	53 (60)	68	407 255
Russet Norkotah	(94) 90		85	---	---	82	83	---	(83)	88		(86)	---	86	353 242
Shepody	(86) 87		88	---	---	72	---	---	(78)	---		(89)	---	83	398 221
A82705-1R	(90) 94		84	---	---	89	---	---	(75)	---		(77)	---	89	428 312
NDTX8731-1R	(92) 97		91	---	---	89	91	---	(80)	93		(68)	85 (88)	91	519 339
Red LaSoda	(88) 75		83	---	---	85	---	---	(---)	---		(88)	---	79	483 408
Location Means	(91) 88		85	84	83 (82)	78	90	82 (77)	89	85		(80)	78 (79)	86	487 262

1/ Clovis, NM: U.S. NO. 1's, > 6 oz.

Western Table 4. 1992 U.S. No. 1's over 12 oz. percent of total yield for locations; overall mean, percent and cwt/acre; early harvest in parentheses.

Entry	Calif		Colo	Idaho		NMex		Oregon			Texas	Wash	Mean		
	Krn	Tul	SLV	Ab	Kim	Clv	Frm	Hrm	Klm	Mal	Spr	Oth	%	cwt/A	
A74212-1E	(7)	56	22	28	27 (32)	7	5	---	19	48	(16)	48 (39)	33	230	109
A8174-2	(11)	29	31	5	6 (7)	2	1	7	15	41	(1)	25 (22)	18	79	39
A81286-1	(15)	46	18	26	34 (12)	6	15	34	21	51	(12)	46 (29)	32	194	50
A81473-2	(8)	43	28	45	39 (24)	9	18	46	44	54	(1)	49 (15)	40	235	36
A81478-1	(3)	54	20	44	23 (18)	4	18	51	30	38	(0)	37 (15)	34	160	22
A82119-3	(16)	41	31	33	26 (21)	4	3	22	29	28	(2)	41 (25)	27	160	50
A8390-3	(13)	42	6	6	12 (13)	6	4	8	21	37	(3)	45 (22)	21	103	50
AC75430-1	(11)	39	29	43	29 (24)	9	18	39	26	64	(9)	39 (27)	35	199	69
AO83037-10	(22)	49	25	32	24 (18)	6	12	30	29	30	(0)	36 (31)	29	186	63
AO84275-3	(12)	30	14	12	7 (11)	3	4	10	5	19	(1)	22 (---)	14	76	20
ATX84378-1Ru	(35)	65	67	62	46 (55)	29	49	64	68	72	(19)	77 (51)	63	342	148
CO82142-4	(28)	53	42	42	42 (18)	5	17	---	29	56	(6)	49 (22)	40	190	54
COO83008-1	(36)	55	21	41	42 (26)	8	16	20	35	44	(18)	55 (30)	35	193	75
NDO2904-7	(31)	58	22	23	18 (16)	10	6	---	35	47	(22)	54 (50)	34	170	129
Lemhi Russet	(18)	46	18	13	16 (16)	8	12	39	17	37	(2)	42 (---)	27	157	46
Russet Burbank	(7)	18	11	7	6 (7)	1	6	13	17	18	(7)	20 (9)	13	77	28
Russet Norkotah	(16)	50	23	---	---	3	3	---	19	26	(3)	---	24	98	27
Shepody	(24)	49	28	---	---	12	---	---	---	---	(12)	---	18	89	40
A82705-1R	(15)	39	21	---	---	7	---	---	---	---	(0)	---	14	66	55
NDTX8731-1R	(18)	28	30	---	---	4	28	---	22	54	(11)	27 (42)	29	166	99
Red LaSoda	(21)	28	28	---	---	12	---	---	---	---	(18)	---	24	148	122
Location Means	(18)	43	25	29	26 (19)	7	13	31	28	43	(8)	42 (24)	30	171	59
1/ U.S. No. 1's over 3".															

l/ U.S. No. 1's over 3".

Western Table 5. 1992 Specific gravity of tubers; early harvest in parentheses.

Entry	Calif		Colo	Idaho		NMex		Oregon			Texas		Wash	Overall
	Krn	Tul	SLV	Ab	Kim	Clv	Frm	Hrm	Klm	Mal	Spr	Oth	Mean	
A74212-1E	(1.084)	1.076	1.078	1.082	1.081 (1.074)	1.080	1.090	1.0--(1.064)	1.074	1.083	(1.078)	1.068(1.073)	1.079 (1.075)	
A8174-2	(68)	77	69	79	75 (73)	75	81	71 (63)	68	70	(63)	68 (67)	73 (67)	
A81286-1	(88)	91	86	83	87 (71)	79	91	83 (60)	78	85	(64)	61 (71)	82 (71)	
A81473-2	(89)	86	87	84	83 (77)	74	88	80 (69)	78	91	(82)	69 (71)	82 (78)	
A81478-1	(88)	96	89	89	86 (80)	79	96	92 (67)	80	94	(87)	70 (73)	87 (79)	
A82119-3	(81)	96	88	87	83 (76)	75	89	93 (63)	79	93	(80)	72 (69)	86 (74)	
A8390-3	(88)	89	78	86	83 (80)	78	89	78 (73)	76	82	(74)	71 (75)	81 (78)	
AC75430-1	(89)	86	88	90	88 (81)	83	90	87 (68)	84	82	(74)	73 (74)	85 (77)	
AO83037-10	(84)	80	77	78	73 (69)	75	83	76 (61)	74	74	(68)	71 (69)	76 (70)	
AO84275-3	(81)	98	95	93	90 (80)	85	101	100 (71)	86	93	(79)	85 (---)	93 (78)	
ATX84378-1Ru	(83)	76	80	82	75 (72)	75	84	71 (60)	77	69	(70)	65 (59)	75 (69)	
CO82142-4	(79)	86	84	84	80 (77)	74	85	--- (65)	76	76	(87)	66 (66)	79 (75)	
COO83008-1	(90)	97	92	88	84 (81)	79	93	81 (69)	80	90	(78)	73 (74)	87 (78)	
NDO2904-7	(73)	78	71	77	71 (71)	69	79	--- (63)	71	64	(68)	65 (66)	72 (68)	
Lemhi Russet	(90)	94	89	90	86 (83)	83	92	86 (70)	86	85	(76)	75 (---)	87 (80)	
Russet Burbank	(88)	92	82	91	78 (78)	78	88	83 (67)	85	74	(73)	75 (72)	83 (76)	
Russet Norkotah	(73)	77	71	---	--- (73)	70	81	--- (65)	69	65	(65)	--- (66)	72 (68)	
Shepody	(84)	78	75	---	--- (78)	71	---	--- (65)	---	---	(69)	--- (70)	75 (73)	
A82705-1R	(76)	72	71	---	--- (70)	68	---	--- (54)	---	---	(61)	--- (57)	70 (64)	
NDTX8731-1R	(66)	71	64	---	--- (69)	63	77	--- (55)	68	57	(60)	54 (56)	65 (61)	
Red LaSoda	(70)	78	67	---	--- (73)	68	---	--- (---)	---	---	(62)	--- (65)	71 (68)	
Location Means	(1.082)	1.080	1.080	1.085	1.081 (1.076)	1.075	1.088	1.084(1.065)	1.077	1.079	(1.072)	1.069(1.068)	1.079 (1.073)	

Western Table 6. 1992 External and internal defects, french fry color, sugar ends, dextrose, and vitamin C.

U.S. No.2

Entry	& Culls > 4 oz %1/	Growth Cracks (10 loc)	Shatter bruise (6 loc)2/	Hollow heart %3/	Black- spot (4 loc)4/	French Fry Color5/	Sugar Ends %6/	Dextrose YSI % DWB7/	Vit.C Mg/100g FWB7/
A74212-1E	6	4.9	4.3	1	1.6	2.7	8	0.14	22
A8174-2	11	4.2	4.5	4	1.3	1.2	6	0.14	25
A81286-1	12	4.2	4.6	1	1.8	1.8	5	0.14	22
A81473-2	9	4.3	3.8	2	1.3	1.3	8	0.15	24
A81478-1	4	4.9	3.8	1	1.7	1.7	8	0.22	25
A82119-3	7	4.9	4.3	3	1.5	1.2	11	0.14	21
A8390-3	5	4.7	3.5	8	2.4	1.2	3	0.38	26
AC75430-1	5	4.8	4.2	26	1.8	1.3	7	0.21	26
AO83037-10	8	4.8	4.4	1	1.8	1.3	8	0.15	30
AO84275-3	4	4.8	4.1	3	2.1	1.3	18	0.17	24
ATX84378-1Ru	15	3.3	3.7	16	2.1	2.3	3	0.26	22
CO82142-4	9	4.2	4.3	9	1.6	3.1	29	0.29	31
COO83008-1	8	4.3	4.4	2	3.1	1.2	10	0.22	23
NDO2904-7	4	5.0	4.7	0	1.1	1.7	5	0.23	29
Lemhi Russet	8	4.7	4.2	10	3.6	1.2	3	0.16	23
Russet Burbank	22	4.0	4.3	7	2.2	1.1	18	0.21	22
Russet Norkotah	3	5.0	4.9	1	---	2.3	---	---	---
Shepody	7	4.6	4.8	1	---	3.0	---	---	---
A82705-1R	1	4.7	4.2	0	---	4.0	---	---	---
NDTX8731-1R	2	5.0	4.2	15	---	3.5	---	---	---
Red LaSoda	10	3.9	4.0	5	---	3.0	---	---	---
Means	7	4.5	4.2	5	1.9	2.0	9	0.20	25

1/ Firm omitted, Clv > 6oz. Late Harvest, nine locations.

2/ 5.0 (none) to 1.0 (severe).

3/ Mean of 11 locations including Early Harvest, > 12 oz. tubers; includes brown center.

4/ Mean of 4 locations, 1.0 (lightest) to 5.0 (darkest).

5/ Mean of 4 locations (SLV, AB, Kim, Kim), out of 45 F storage, < 1.0 (lightest) to 4.0 (darkest).

6/ Mean of 4 locations (Ab, Kim, Hrm, Mal).

7/ Aberdeen tubers only, sampled late October.

Western Table 7. 1992 Merit scores, processing and fresh market, and disposition.

Entry	Merit Score: Processing ^{1/}				Merit Score: Fresh Market ^{1/}				Mean	Disposition
	Colo	ID	Ore	Hrm	Calif	Colo	ID	Ore		
	SLV	2/	---		TUL	SLV	2/	HRM		
A74212-1E	1.0	2.0	---	1.5	4.7	5.0	4.0	---	4.3	CONT
A8174-2	2.0	2.0	1.0	1.7	3.3	1.0	3.0	1.0	2.3	DROP
A81286-1	3.0	4.0	1.0	2.7	3.3	3.0	3.0	1.0	2.6	CONT
A81473-2	5.0	4.0	1.0	3.3	3.5	4.0	4.0	2.0	3.3	"
A81478-1	1.0	5.0	2.0	2.7	4.3	1.0	4.0	3.0	3.0	DROP
A82119-3	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0	3.4	CONT
A8390-3	1.0	3.0	1.0	1.7	3.5	1.0	4.0	1.0	2.4	"
AC75430-1	1.0	3.0	2.0	2.0	3.7	1.0	4.0	2.0	2.8	DROP
AO83037-10	5.0	3.0	3.0	3.7	3.7	5.0	3.0	4.0	3.7	CONT
AO84275-3	5.0	4.0	3.0	4.0	4.3	4.0	4.0	3.0	3.6	"
ATX84378-1Ru	2.0	2.0	1.0	1.7	2.8	2.0	4.0	1.0	2.7	"
CO82142-4	1.0	2.0	---	1.5	3.5	3.0	3.0	---	3.1	RTC
COO83008-1	3.0	5.0	4.0	4.0	4.3	2.0	4.0	3.0	3.3	"
NDO2904-7	3.0	2.0	---	2.5	4.3	3.0	5.0	---	4.0	CONT
Lemhi Russet	2.0	3.0	2.0	2.3	3.5	2.0	4.0	3.0	3.1	CHECK
Russet Burbank	3.0	3.0	1.0	2.3	3.3	2.0	3.0	1.0	2.3	"
Russet Norkotah	1.0	1.0	---	1.0	4.0	1.0	4.0	---	3.0	"
Shepody	1.0	3.0	---	2.0	3.3	5.0	2.0	---	3.4	"
A82705-1R	1.0	1.0	---	1.0	4.5	3.0	5.0	---	4.0	CONT
NDTX8731-1R	1.0	1.0	---	1.0	4.0	3.0	4.0	---	3.7	"
Red LaSoda	1.0	1.0	---	1.0	3.3	4.0	3.0	---	3.5	CHECK
Location Means	2.2	2.8	2.0	2.3	3.8	2.8	3.7	2.2	3.1	3.2

1/ 1.0 (poorest) to 5.0 (best).

2/ Composite scores for Ab & Kim

3/ RTC = regional testing completed (3 yrs), CONT = continue in trial, DROP = drop from trial.

California

R.E. Voss, K.L. Brittan, G. Browne, H. Carlson, D. Holm, R. Johansen, J. Pavak

Objectives:

1. Obtain or develop new and/or improved russet, white, red, processing and specialties of higher yields and quality.
2. Demonstrate the characteristics of the many new varieties and advanced selections being developed in the US.
3. Determine relative resistance/susceptibility of named varieties and advanced selections to powdery scab and other diseases.
4. Establish an improved seed increase program.

Summary:

Replicated yield trials were grown in five locations—Kern County (2), Tulalake, Humboldt, and Santa Clara County. Observational trials of varying size (2x27-hill, 27-hill and 12-hill) were grown at Tulalake and in Kern County. Seed increase blocks were grown at Tulalake and Stockton Delta (2). A total of 100 russets, 45 chippers, 15 long whites, 60 reds and 10 specialty types were grown. This compares with 200, 30, 10, 60, and 20, respectively, in 1991. Selected for further evaluation from 1992 observational trials were 55 russets, 33 reds, 14 chippers, 3 long whites and 5 specialty clones. This was a general decrease in number, indicating the concentration on more advanced lines. No first-year seedlings or 5-hill observational trials were grown.

Included in the trials were 15 entries in the Western Regional Trials, nearly all russets, and 14 entries in the national Snack Food Association trials. A storage trial was conducted at Tulalake with entries from the replicated yield trial. The best storing entries were AO83037-10, Russet Burbank, A83090-3, NDD840-1, Norqueen, Russet Norkotah, NDTX8-731-1R and Red La Soda.

The most promising advanced selections or new varieties that have been tested in California with the best results in 1992 include:

<u>Russets</u>	<u>Chippers</u>	<u>Reds</u>	<u>Long Whites</u>	<u>Specialty</u>
A74212-1E	Atlantic	A82705-1	ND2050-1	Rose Gold
AC83064-1	AC80545-1 (Chipeta)	A83359-5	A76147-2	Yukon Gold
AC83064-6	AC83306-1	ND03503-5	White Rose	Brigus
AO83037-10	AC84610-2	Red La Soda	AD84087-1	
NDD840-1	AC84610-5	LA12-59R		
ND02904-7	B9792-8B (Suncrisp)	ND02686-6		
AC84025-4		ND02686-10		
AC84509-2				
AD87005-1				
AD87070-4				
BO-180-18				

Replicated Yield Trials:

Two trial locations were used in Kern County. Yields in the russet trial were moderately low, averaging 325 cwt/A total and 310 cwt/A No.1 yields with a range of 460 to 150 and 450 to 135, respectively. Highest yielders

were AC83064-1, AO83037-10, ATX84378-1, A74212-1E (Century Russet), and CO82142-4. Of these, AO83037-10 was susceptible to black spot, and CO82142-4 was susceptible to hollow heart and scab.

The yields of reds in Kern County ranged from 410 to 205 and 405 to 195 cwt/A for total and No.1 yields, respectively, averaging 330 and 315 cwt/A. The highest yielding reds were NDO3573-3, A83359-5 and Red La Soda. Red La Soda exhibited some black spot and internal necrosis; A83359-5 exhibited some hollow heart and black spot. The highest yielding long whites were ND2050-1 and White Rose (325 and 315 cwt/A total yield, respectively). Leafroll and mosaic viruses were present in some seed lots, preventing yield expression.

The yield of chip varieties ranged from 565 cwt/A (AC83306-1) to 100 cwt/A (W870). Other high yielding entries were AC80545-1 (Chipeta), AC84610-2 and AC83311-2. The yields of Snack Food Association entries were generally lower than the replicated yield trial entries despite being planted, grown and harvested adjacent in the same field. Specific gravity ranged from 1.096 (A80559-2) to 1.073 (CS7232-4); high gravity entries included W887, Atlantic and B9792-8B. Samples of all entries were commercially chipped and evaluated. Agtron color ranged from 63 to 69, all good; total defects (external plus internal) ranged from 3% (E55-44) to 16% (B9792-8B), by weight, in the SFA trial. In the replicated yield trial, Agtron color ranged from 70 (Atlantic and W848) to 61 (AC83306-1), all acceptable to excellent. The total defects, however, ranged from a high of 83% (AD84602-1), all internal, to 0% (AC84610-5). Other entries with low defects included AC84610-2 and W848.

At the Intermountain Research and Extension Center at Tulalake, yields were exceptionally high, and quality was also good. Russet total and No.1 yields averaged 565 and 545 cwt/A, respectively. Highest yielding entries were A74212-1E and A74212-1 (Century Russet), Lemhi, AO83037-10, A84180-8 and AC83064-1, all with over 700 cwt/A of No.1's. Black spot was not a problem in 1992, but several lines exhibited hollow heart, including Lemhi, AC75430-1, A83090-3 and ATX6-84378-1. Growth cracks were high in A81286-1, A81473-2 and A81074-2. Several entries were infected with early blight; all of them were early or early-medium maturity lines.

At Tulalake, numerous reds were evaluated. The yields ranged from 875 to 335 and 870 to 315 cwt/A for total and No.1 yields, respectively. The highest yielding entries were NDO3573-3, NDO3573-5, NDO3503-5 and NDTX8-731-1. The first two of these broke down severely and early in storage, while the last is an excellent, long-term storage line. Despite the high yields and large size of many of the entries, hollow heart was not a serious problem. Several lines had growth cracks, however, the most severe being Red La Soda and NDO3504-3. As in the russets, the earliest maturing lines had early blight. One entry, NDA3003-1, experienced seed piece decay and thus had only a 50% stand.

Storage evaluation of Tulalake entries were made periodically for 175 days. Numerous entries developed shatter bruise, while others were free from it. The "best" storing russets, based on disease, sprouting and turgor, included Russet Burbank, A81074-2, AC75430-1, Frontier, Lemhi, NDD840-1 and Norqueen. Best storing reds included NDTX8-731-1R, AD82706-1 and NDO3503-2.

Varieties that performed well in other trials in California were Kennebec, AC83306-1 and Atlantic in the Humboldt County chip trial; and Purple Chief, A83359-5R, All Blue, and Yukon Gold in the Santa Clara County specialty trial.

Seed increase blocks were grown in Tulalake and the Stockton Delta. The Tulalake block contained entries where California was the only seed source, and visual virus was suspected to be present. The Delta blocks contained entries that had been indexed at Half Moon Bay or otherwise considered free from significant virus content. The following selections are to be increased in California with the goal of having 30 cwt of seed available at the end of 1993: AD82745-1R, A83359-5R, NDD840-1RU, AD84087-1W, ND2050-1W, A84662-1R and AV Russet.

Table 1 provides a summary of entries at the various replicated trial locations. Table 2 lists the selections from non-replicated plots.

Table 1a
California
Summary of No. 1 Yields, Tuber Quality and Storageability
Of Standard and Potential Varieties

Variety	Kern	Kern KSF	IREC	Humbolt	Adj. Dev. From Mean	Specific Gravity	Tuber Rating	Storage 5 = Exl.	Notes
A. Russet									
A74212-1E	367		916		197	80	4	3	SI.KN & VD
A81074-2	265		383		-121	73	3	4	GC, KN, HH, IN
A81286-1	256		579		-27	90	3	4	GC, AH
A81473-2	345		547		2	88	3	3	GC
A81478-1	287		495		-54	92	4	4	GC, RH
A82119-3	288		628		13	89	4	4	GC, AH, KN
A83090-3	299		548		-21	89	3	2	GC, AH, HH, SL.Rot
A84180-8			714		135	85	4	4	GC, AH, KN
AC75430-1	321		689		60	88	4	3	GC, AH, KN, HH, IN
AC83064-1	449		701		130	76	4	1	RH, Cateye, Rot, IN
AC83064-6	313		554		-11	75	4	4	RH, sl.Rot
AC83068-1	348				38	81	4		Sev. HH, IN, Scab
AC84028-4	259		347		-142	82	4	4	sl.HH
AC84487-1	274		506		-54	73	4	4	GC
AO83037-10	378		719		104	82	4	4	GC, RH, AH
AO84275-3	336		608		27	90	4	3	HH, IN, SEB,GC, MS, RH
ATX84378-1	375		530		8	80	3	3	GC, AH, KN, Rot, HH, Big
Century			822		243	82	4	5	KN, MS, PE
CO80011-5	308		527		-27	71	3	3	GC, MS, KN
CO81082-1	271		338		-140	78	3	4	KN, SM
CO82142-4	363		482		-22	83	4	4	HH, IN, GC, KN,AH
COO83008-1	338		564		7	94	4	3	SI.HH, GC, MS, L
Frontier			568		-11	87	4	4	SI.HH, GC, MS, Pink-eye
Goldrush			601		21	78	4	4	
Hilite			524		-55	88	4	4	PE, SK
Lemhi Russet	330		729		85	92	3	3	KN, RH, MS, VD, BS
NDD840-1			568		-11	81	4	5	HH
NDO2904-7	307		618		18	76	4	4	
Norqueen			427		-152	76	4	5	GC, EL, RH
Rus. Burbank	284		567		-19	90	3	5	GC, KN, MS, HH, IN
Rus. Norkotah	253		570		-33	75	4	4	SEB, BS, RH, KN
TND329-1	135				-175	60	4		BS
Average	310		579						

Table 1b
California
Summary of No. 1 Yields, Tuber Quality and Storageability
Of Standard and Potential Varieties

Variety	Kern	Kern KSF	IREC	Humbolt	Adj. Dev. From Mean	Specific Gravity	Tuber Rating	Storage 5 = Exl.	Notes
B. Reds									
A82705-1			488	166	-78	78	4	4	GC, Rot, SB
A82745-1			404		-169	77	4	3	SK, Hvy. S8, PE
A83359-5			621	227	19	77	3	2	HH, GC, SK, RH
AD82706-2	194		447		-123	75	4	4	GC, SK, GN
NDA3003-1	320		328	251	-75	78	3	1	GC, Scab
NDO3432-3			625		52	70	3	4	KN, MS, GC, GN
NDO3503-2	309		453		-63	92	3	3	GC, RH, SK
NDO3503-5	334		751		98	79	4	2	GC, S8
NDO3504-3	290		317		-141	70	2	2	GC, Hvy. SB
NDO3573-3	404		871		194	72	4	1	MS, S8, SK
NDO3573-5	323		825		130	73	4	1	GC, Rot, Hvy. S8
NDTX8-731-1R	278		668		29	69	4	4	IN, 8ig, SI.HH
Red LaSoda	383		651	305	71	80	3	4	HH, GC, SK, S8
Average	315		573	237					
C. Whites									
A76147-2	191		372	532	-19	85	4	4	GC, MS,RH, GN, IN
A80559-2		204			-15	96			S8,Rot,Small
A84712-1	224				-84	70			SER, Scab
AC80545-1	476				168	77			Narrow Leaf
AC83306-1	551			398	156	89	4		VD, GC, AH, GN
AC83311-2	373				65	74			SB, Large Leaf
AC83311-5	172				-136	72			RH, 8S
AC84610-2	453				146	82			ID, SI. VD, SB
AC84610-5	307				0	77			SI. ID, & HH, BS
AC85438-4				140	-190	94	4		GC, SM, GN
AD74548-5	171				-136	78			VD, SB
AD84545-1	284				-24	86			SI. VD
AD84602-1	275				-33	66			VD
Atlantic	352	328		383	69	95	4		HH, sl. VD, GN, AH, BS
8141			346		-169	97	2	3	Sev.HH, GC
B9792-8B		365			147	89			SB
80-178-34		252			34	87			IN
80-203-21				306	-25	95	4		
Chipeta	420			342	62	85	4		GC, GN, RH, SI.MS
CO84111-6	398			235	-2	89	4		HH, VD, ID, SB
CS7232-4		226			7	73			VD
E55-35		154			-64	83			
E55-44		145			-74	75			SB
Kennebec			699	401	127	95	4	3	SI.HH, KN, GN, GC
Konona				312	-18	96	4		SM, SC
LaBella				283	-47	95	4		
ND2050-1	315				7	76			IN
Norchip		209			-10	75			SER,VD, S8, GC
NY88		165			-54	77			
Shapody	257		445		-60	81	3	5	IN, VD, BS, GC, SC, KN
Stuben				302	-28	88	4		GC, AH
Tejon	204				-103	81			VD
W848	206				-102	70			VD, SEB
W870		76			-143	85			SER, Small
W887		281			62	95			
White Rose	310		713		100	81	3	4	VD, SEB, GC, KN, RH, S8
Yukon Gold	213				-95	81			IN, SEB, GC, Rot, SB
Average	308		515	330					

Table 2a
CALIFORNIA
Selections From Non-Replicated Observational Plots

Clone	Location		Clone	Location	
Russets			Russets		
A79180-10		T-27	AD88141-1		T-27
A83037-2		T-27	AD88162-2	K-12	
A83043-12	K-12		AD88164-1	K-27	
A84422-3	K-12		AD88164-1		T-12
A84458-9	K-27		AD88164-3	K-27	
A86011-16	K-27		AD88500-1		T-12
A86011-8	K-12		AND7430-1	K-27	
A86042-1	K-27	T-27	AO80432-1		T-27
A86051-1	K-12		AO84078-1	K-27	T-27
A86093-13		T-27	AV Russet		T-27
A86102-6		T-27	BO180-18	K-27	T-27
A86102-6	K-12		CalOre		T-27
A86115-2		T-27	CO83054-4		T-27
AC78069-17	K-27		CO84074-2	K-27	
AC83068-1		T-27	CO85026-4	K-27	
AC83172-1	K-27		CO85168-4	K-27	
AC84025-4	K-27	T-27	CO86058-1		T-12
AC84509-2	K-27	T-27	ND1538-1	K-27	
AC86135-4	K-12	T-12	ND671-4	K-27	
AD71908-4		T-27	NDD2346-3		T-27
AD82162-3	K-27		NDD2629-1		T-27
AD83011-5		T-27	NDD837-2		T-27
AD83044-2	K-27		NDD840-1		T-27
AD83071-2		T-12	NDD840-1	K-12	
AD83177-6	K-27				
AD83222-1	K-27				
AD85369-1	K-27				
AD87005-1	K-27	T-27			
AD87070-4	K-27	T-27			
AD87167-3	K-27				

Table 2b
CALIFORNIA
Selections From Non-Replicated Observational Plots

Clone		Location	
Reds			
A83359-7	K-27		
A84642-2	K-27	T-27	
A84651-2	K-27		
AD81560-4	K-27		
AD88500-1	K-27		
CD87154-3	K-27		
CO86218-2	K-12		
COA86147-3	K-27		
DT6063-1		T-27	
LA12-59	K-27	T-27	
ND2224-5	K-27		
ND2224-5		T-12	
NDO2438-6	K-27	T-27	
NDO2438-7	K-27	T-27	
NDO2438-9	K-27	T-27	
NDO2469-1		T-27	
NDO2469-1	K-12		
NDO2486-4		T-27	
NDO2486-4	K-12		
NDO2686-10	K-27	T-27	
NDO2686-6	K-27	T-27	
NDO3503-2	K-27		
NDO3504-3	K-27		
NDO3573-5	K-27		
NDO3849-12	K-27	T-27	
NDO3994-2	K-27		
NDO3994-2		T-12	
NDO4001-2	K-27		
NDO4030-12	K-27	T-27	
NDTX9-1068-11	K-27		
No Tag2 Red	K-27		
Rose Gold		T-27	

Clone		Location	
Whites			
A84369-1	K-27	T-27	
AC80545-1		T-27	
AC83311-2		T-27	
AC83311-5		T-27	
AC86385-1	K-12		
AD81138-12		T-27	
AD84087-1	K-27	T-27	
B-180-36		T-27	
BC0894-2	K-12	T-12	
BO-257-12		T-27	
BO203-21	K-27		
CO86106-3	K-12		
CO86106-4	K-12		
G742-4	K-27		
Konona		T-27	
ND2050-1		T-27	
Nipigon		T-12	
Spunta		T-27	
Purple			
678771	K-27		
Yellow Flesh			
Delta Gold	K-27		
Yukon Gold		T-27	

COLORADO

David G. Holm

Breeding Program

Thirty-three parental clones were intercrossed in 1992. Seeds from 119 combinations were obtained. Sixty-four seedling families were grown in the greenhouse producing 15,159 tubers for initial field selection in 1993. Surplus tubers were distributed to Idaho, Oregon, and Texas.

Seedling tubers were obtained from Dr. J. J. Pavek, USDA-ARS, Aberdeen, Idaho; Dr. J. Creighton Miller, Texas A&M, Lubbock, Texas; Dr. Dermot Lynch, Agriculture Canada, Lethbridge, Alberta; Dr. Robert Johansen, North Dakota State University, Fargo, North Dakota; Dr. Kathleen Haynes, USDA-ARS, Beltsville, Maryland; and Dr. Robert E. Hanneman, USDA-ARS, Madison, Wisconsin.

Selection Program

A total of 68,800 first-year seedlings were planted, with 727 being selected for further observation. Another 1,106 clones were in various stages of preliminary and intermediate testing. Two hundred three of these clones were saved for further evaluation. Twenty-nine advanced selections were saved and will be increased.

Advanced Yield Trial

Twenty-eight clones, 23 advanced selections and five cultivars, were evaluated in the advanced yield trial. Results on yield, grade, and other characteristics are summarized in Table 1.

Advanced russet selections that show promise for release or that have been released to growers for evaluation are AC78069-17, AC83064-1, AC83064-6, AC83068-1, AC83172-1, AC84028-4, AC84487-1, CO80011-5, CO81082-1, and CO84074-2. Selections AC83064-1, AC83064-6, and AC83172-1 will be evaluated in the Western Regional Trials in 1993.

Western Regional Trial

Selections entered by Colorado were AC75430-1 and CO82142-4. AC75430-1 was discarded from further testing. CO82142-4 graduated from the trials after three years of testing and is currently undergoing commercial evaluation. Results of this trial are presented in the Western Regional Trial report elsewhere in this publication.

Western Regional and Advanced Chipping Trial

A formalized Western Regional Chipping Trial was not conducted in 1992. However a modified version of this trial was conducted in the San Luis Valley with advanced material primarily from our program. Results of this trial are presented in Tables 2 and 3.

Advanced Colorado selections that have shown considerable potential in these trials in the current or past years are AC80545-1 and AC83306-1.

Additional Chipping Studies

Forty-eight clones, 45 selections and 3 cultivars, were tested for chipping potential after various storage regimes.

This information is presented in Table 4.

Ten selections produced acceptable chips after 7 weeks of 40F storage. Also thirty-three of the selections produced acceptable chips with reconditioning after storage at 40F.

Sixteen selections were chipped by Borden, Inc. Results are given in Table 5. Twelve selections produced acceptable chips on both evaluation dates.

Grower Tests

Grower evaluations were conducted on five russets (AC75430-1, AC78069-17, CO80011-5, CO81082-1, and CO82142-4) and one chipper (AC80545-1). Selection AC75430-1 was discarded from further testing. Testing will continue on AC78069-17, CO81082-1, and CO82142-4 during 1993. AC80545-1 and CO80011-5 will be named in 1993.

Selections to be released for initial grower evaluation in 1993 are AC83064-1, AC83064-6, AC83068-1 (russet with red eyes), AC83172-1, and AC83306-1. AC83306-1 is a chipper.

Russets with processing potential include AC78069-17, AC83064-6 and AC83172-1.

Data on these selections and recently named and standard cultivars are summarized in Table 6.

Cultivar Releases

AC80545-1 (Chipeta) was selected in Colorado and will be released in 1993 jointly by the Colorado and Idaho Agricultural Experiment Stations and the USDA-ARS. AC80545-1 will be

released as a high yielding, medium-late maturing, chipping cultivar. Tubers have medium-long dormancy with good storability and few internal problems.

CO80011-5 will be released by the Colorado Agricultural Experiment Station in late 1993 as a high yielding, medium-early maturing, fresh market potato. Tubers tend to be flat and have a low specific gravity.

Russet Norkotah Selection Studies

Fifty clonal selections of Russet Norkotah were selected from three certified seed lots in 1990-1991. Selection was based on increased vine vigor. Eleven of these selections remain and will be compared in yield trials in 1993.

Colorado Table 1. Yield, grade, stand, vine maturity, specific gravity, stem number per plant and tuber shape and skin type for advanced yield trial clones - 1992.

Clone	Yield (Cwt/A)					% Stand	Vine Maturity ¹	Specific Gravity	Stems/ Plant	Tuber Shape & Skin Type ²
	Total	US #1								
		Total	%	>10 oz	<4 oz					
AC78069-17	474	430	90.6	178	32	99	3.5	1.081	3.9	Ob, R
AC83064-1	542	494	91.2	99	48	100	3.0	1.077	3.9	L, R
AC83064-6	456	396	86.8	83	57	99	3.0	1.076	3.3	L, R
AC83068-1	539	470	87.2	20	68	100	2.8	1.083	4.2	Ob, R
AC83172-1	368	285	77.5	25	82	99	2.5	1.094	4.2	L, R
AC84028-4	419	337	80.4	41	81	99	1.8	1.080	3.4	L, R
AC84487-1	431	379	87.8	72	48	98	1.2	1.072	4.6	L, R
AC86135-4	406	256	62.9	0	151	99	1.0	1.082	3.8	Ob, R
CO80011-5	427	371	87.0	68	46	99	2.2	1.070	3.5	L, R
CO81082-1	365	311	85.4	54	53	96	1.5	1.074	3.2	L, R
CO84074-2	427	342	80.0	30	85	99	2.5	1.069	3.4	Ob, R
CO84205-5	556	500	89.8	213	40	98	1.8	1.066	3.8	Ob, R
CO85026-4	422	371	87.7	75	50	97	3.5	1.078	2.8	L, R
CO85168-4	433	306	70.6	13	127	100	3.0	1.086	3.7	Ob, R
CO86030-1	477	437	91.6	152	38	100	2.8	1.076	3.2	L, R
CO86051-3	446	381	85.3	146	32	100	2.5	1.079	3.8	Ob, R
CO86058-1	500	392	78.2	43	94	100	2.0	1.075	4.6	Ob, R
CO86142-3	443	328	73.9	18	113	100	1.0	1.079	4.0	R, Re
CO86153-2	451	413	91.5	113	34	98	3.8	1.084	3.6	Ob, R
CO86218-2	457	335	73.1	47	119	98	2.5	1.071	2.7	R, Re
COT8-86146-2	535	470	87.8	160	49	99	2.5	1.073	2.6	R, Re
SS-T	368	217	58.8	5	151	96	1.0	1.066	3.4	Ov, Re
TXAV657-27	523	439	83.8	83	80	100	1.5	1.082	5.2	Ob, R
Centennial Russet	392	295	75.3	11	97	99	2.8	1.073	3.2	Ob, R
Russet Norkotah	341	285	83.6	75	48	97	1.0	1.072	3.2	L, R
Russet Nugget	523	450	86.1	96	71	98	4.2	1.097	3.7	Ob, R
Sangre	443	329	73.9	38	112	100	1.5	1.070	3.4	Ov, Re
Siskiyou	540	410	76.2	159	85	100	5.0	1.109	2.2	L, W
Mean	454	372	81.6	76	75	99	2.4	1.078	3.6	-----
LSD ³ (0.05)	45	50	5	37	18	NS ⁴	0.6	-----	0.6	-----

¹Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

²Tuber shape: R=round; Ov=oval; Ob=oblong; L=long. Skin type: R=russet; Re=red; W=white.

³LSD=least significant difference.

⁴NS=not significant.

Colorado Table 2. Yield, grade, stand, vine maturity, specific gravity, stem number per plant and tuber shape and skin type for Western Regional and advanced chipping yield trial clones - 1992.

Clone	Yield (Cwt/A)					% Stand	Vine Maturity ¹	Specific Gravity	Stems/ Plant	Tuber Shape & Skin Type ²
	Total	US #1		>10 oz	<4 oz					
		Total	%							
AC80545-1	570	496	86.8	185	60	99	3.5	1.086	3.6	R, W
AC83306-1	524	386	73.8	81	105	100	3.2	1.093	4.3	R, W
AC84610-5	442	241	54.2	6	201	100	2.8	1.082	4.5	R, W
AC85438-4	415	295	70.7	40	110	96	2.8	1.089	3.6	R, W
AC86444-5	371	221	59.4	12	150	94	1.0	1.081	3.8	R, W
AC86449-1	395	163	40.1	7	231	98	2.5	1.087	4.5	R, W
AC86449-2	364	131	35.8	0	233	97	1.0	1.078	4.2	R, W
ATX7-85404-8	481	301	62.6	30	178	98	2.5	1.094	4.8	R, W
BC0894-2	471	367	77.9	24	103	95	1.2	1.077	2.7	R, W
CO86106-3	456	385	84.2	77	71	94	3.0	1.084	2.4	Ov, W
CO86106-4	571	506	88.6	151	65	97	3.0	1.087	3.2	R, W
CO86224-1	465	367	78.8	46	98	100	3.0	1.091	5.0	Ob, W
NDO1496-1	474	319	67.2	57	155	97	1.8	1.091	4.2	R, W
Atlantic	461	364	79.0	58	96	96	2.8	1.094	3.0	R, W
Calchip	402	280	69.8	38	120	97	3.8	1.113	2.7	Ov, W
Gemchip	494	412	83.4	83	81	97	3.0	1.087	3.4	R, W
Norchip	381	252	66.2	26	123	96	1.8	1.080	3.2	R, W
Snowden	484	277	57.1	16	208	100	2.8	1.091	4.4	R, W
Mean	457	320	68.7	52	133	97	2.5	1.088	3.8	-----
LSD ³ (0.05)	51	56	7.4	35	25	4	0.6	-----	0.6	-----

¹Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

²Tuber shape: R=round; Ob=oblong; Ov=oval. Skin type: W=white.

³Least significant difference.

Colorado Table 3. Chip color¹ and specific gravity for Western
Regional and advanced chipping yield trial clones
- 1992.

Clone	7 wks 40F	7 wks 50F	7 wks/40F +3 wks/60F	7 wks/50F +3 wks/60F	Specific Gravity
AC80545-1	3.0	1.5	1.5	1.5	1.086
AC83306-1	2.5	1.5	1.5	1.5	1.093
AC84610-5	2.0	2.5	1.5	2.0	1.082
AC85438-4	2.5	1.5	1.5	1.0	1.089
AC86444-5	2.5	2.0	2.0	1.5	1.081
AC86449-1	2.0	1.0	1.0	2.0	1.087
AC86449-2	2.5	1.5	1.5	1.5	1.078
ATX7-85404-8	2.5	1.5	1.5	1.0	1.094
BC0894-2	2.0	1.0	2.5	1.0	1.077
CO86106-3	3.0	2.0	2.5	2.5	1.084
CO86106-4	3.5	1.5	1.5	1.0	1.087
CO86224-1	3.0	2.5	2.0	2.0	1.091
NDO1496-1	3.0	1.0	1.5	1.5	1.091
Atlantic	3.0	1.5	2.0	1.5	1.094
Calchip	3.0	1.5	2.0	1.5	1.113
Gemchip	3.0	3.0	3.0	2.5	1.087
Norchip	3.5	1.5	2.5	2.5	1.080
Snowden	3.5	1.5	1.0	2.0	1.091

¹Chip color was rated using the Snack Food Association 1-5 scale.
Ratings ≤ 2.5 are acceptable.

Colorado Table 4. Chip color¹ and specific gravity of San Luis Valley chipping study entries - 1992.

Clone	7 wks 40F	7 wks 50F	7 wks/40F +3 wks/60F	7 wks/50F +3 wks/60F	Specific Gravity
AC80545-1	4.0	2.0	3.5	1.0	1.088
AC83306-1	3.0	1.5	1.5	2.0	1.080
AC84610-5	3.5	1.0	1.5	1.5	1.094
AC86444-5	3.0	2.0	2.0	2.0	1.084
AC86449-1	2.5	1.0	1.5	1.5	1.093
AC86449-2	2.0	1.0	2.0	1.5	1.084
AC87057-1	4.5	2.5	4.0	3.0	1.088
AC87313-3	3.0	2.0	1.5	1.5	1.084
AC87345-2	3.5	2.5	2.5	2.5	1.085
AC88344-3	3.5	3.0	3.0	2.5	1.086
AC88351-3	4.5	3.0	4.0	3.5	1.071
AC88356-1	3.0	1.5	2.0	1.5	1.082
AC88357-1	2.0	1.5	1.0	1.0	1.094
AC88357-2	4.0	3.5	4.0	2.5	1.085
AC88357-3	2.5	1.0	2.0	1.5	1.088
AC88431-3	3.0	2.5	2.0	1.5	1.080
AC88456-4	3.0	1.5	2.5	1.0	1.084
AC88456-6	2.5	1.5	2.0	1.5	1.097
AC88459-4	2.5	1.5	2.0	1.5	1.083
AC88461-3	4.0	2.5	3.5	3.0	1.071
AC88463-5	3.5	2.0	4.0	2.0	1.073
AC88620-1	4.0	2.5	3.0	2.5	1.080
AC88632-3	4.0	2.5	3.5	2.5	1.076
AC88633-2	4.0	3.0	3.5	3.5	1.074
AC88634-2	3.5	3.0	3.0	2.5	1.082
AC88637-2	2.5	1.5	1.5	1.0	1.082
ATX85404-6	4.0	2.0	2.5	2.5	1.074
ATX85404-8	2.5	1.5	1.5	1.0	1.086
BC0894-2	2.5	1.5	1.5	1.0	1.081
BC1138-4	4.5	3.0	4.0	3.5	1.080
CO86106-3	4.5	1.5	3.5	2.0	1.075
CO86106-4	3.5	2.0	2.5	1.5	1.076
CO86224-1	3.0	3.0	2.0	2.0	1.081
CO87017-5	3.5	2.0	2.0	1.0	1.083
CO87106-5	3.5	1.5	2.5	1.5	1.089
CO88048-7	4.5	2.5	2.5	2.0	1.082
CO88056-2	3.5	3.0	4.0	3.5	1.078
CO88056-4	3.5	2.0	2.5	2.5	1.071
CO88060-7	4.0	3.5	2.5	2.0	1.083
ND1995-1	2.0	1.0	1.0	1.0	1.086
NDC4081-5	4.0	2.0	2.0	2.0	1.077
NDC4137-1	5.0	3.0	3.5	3.0	1.084
NDC4151-3	4.0	3.0	2.5	2.5	1.075
NDC4187-1	3.5	2.0	2.5	2.5	1.069
NDO1496-1	3.0	1.0	1.5	1.0	1.091
Atlantic	3.5	2.5	2.5	2.0	1.090
Norchip	3.5	2.0	2.5	1.0	1.076
Snowden	3.0	1.5	1.0	1.0	1.084

¹Chip color was rated using the Snack Food Association 1-5 scale.
Ratings ≤ 2.5 are acceptable.

Colorado Table 5. Chip color¹ and specific gravity
gravity evaluations - Borden,
Inc.² - 1992.

Clone	Specific Gravity	Oct. 27 ³	Feb. 5 ³
AC80545-1	1.083	2.5	2.5
AC83306-1	1.077	2.5	4.0
AC84610-5	1.092	2.5	2.0
AC86444-5	1.079	3.0	2.5
AC86449-1	1.085	1.5	1.5
AC86449-2	1.078	2.0	2.0
AC87057-1	1.086	4.0	4.5
AC87313-3	1.084	3.0	2.0
AC87345-2	1.078	4.5	3.5
ATX7-85404-8	1.084	1.5	2.0
BC0894-2	1.077	2.0	2.0
CO86106-3	1.077	3.5	4.0
CO86106-4	1.085	5.0	2.5
CO86224-1	1.083	6.0	3.0
CO87017-5	1.085	2.0	2.0
CO87106-5	1.089	2.5	2.5
Atlantic	1.092	4.0	4.0
Norchip	1.081	3.5	3.5
Snowden	1.086	1.5	1.5

¹Chip color was rated using the PCII 1-10 scale.
Ratings of 1-4 acceptable, 5 marginal.

²Data collected by Mr. Larry Anderson.

³Potatoes were harvested September 3-4 and held
at approximately 55-60F prior to chipping on
October 27. Tubers were then gradually cooled
to 50-52F for storage.

Colorado Table 6. Comparison of clones for yield, grade, maturity, specific gravity, and grade defects.

Clone	Usage ¹	Loc x Years	Total Yield (Cwt/A)	% US #1	Vine Maturity ²	Specific Gravity	% External Defects ³	% Hollow Heart ⁴
Russets								
A74212-1	FM	6	422	81.7	3.3	1.084	4.6	0.2
CO80011-5	FM	7	372	82.6	2.3	1.074	3.0	0.1
AC78069-17	FM/FRY	6	398	88.1	3.3	1.085	4.3	0.4
CO81082-1	FM	6	341	85.1	2.1	1.075	0.5	0.7
CO82142-4	FM	5	394	91.5	3.7	1.088	0.8	0.5
AC83064-1	FM	4	481	87.7	3.2	1.081	1.0	0.0
AC83064-6	FM/FRY	4	381	83.8	3.1	1.081	0.7	0.2
AC83068-1	FM	4	506	82.4	3.2	1.086	2.0	0.5
AC83172-1	FM/FRY	4	388	78.3	2.9	1.098	0.6	0.0
Centennial Russet	FM	20	299	77.4	3.0	1.083	1.0	0.5
Frontier Russet	FM/FRY	3	271	84.2	2.0	1.089	2.8	0.3
Goldrush	FM	2	408	85.2	2.5	1.079	1.8	0.0
Norqueen	FM	2	308	63.4	2.5	1.074	1.3	0.3
Ranger Russet	FM/FRY	3	371	86.0	3.4	1.089	2.3	0.0
Russet Burbank	FM/FRY	20	369	64.4	2.8	1.086	9.7	1.5
Russet Norkotah	FM	9	288	81.2	1.3	1.075	2.0	0.2
Russet Nugget	FM/FRY	10	374	80.0	4.0	1.098	1.7	0.3
Chippers								
AC80545-1	CHIP	7	462	83.9	3.5	1.090	3.1	0.1
AC83306-1	CHIP	4	468	72.3	3.2	1.093	6.4	0.1
Atlantic	CHIP	6	403	84.9	3.4	1.100	1.3	2.6
Gemchip	CHIP	9	409	83.6	3.4	1.090	1.4	1.8
Norchip	CHIP	12	334	73.6	1.9	1.083	5.8	0.6

¹FM=fresh market, FRY=french fry.

²Vine maturity: 1=very early; 2=early; 3=medium; 4=late; 5=very late.

³Includes defects such as growth crack, second growth, misshapen, and green.

⁴Based on tubers greater than 10 ounces.

Florida

J. R. Shumaker, D. P. Weingartner, and Steve Molnar

Methods

Five potato variety trials were conducted at the Agricultural Research and Education Center, Hastings, Florida during the 1992 spring growing season. The trials were grouped into intermediate (2 replications), advanced (4 replications), and russet skinned. The potential varieties and seedlings were tested for their adaptability to Florida conditions. Seed was hand cut and placed 12 inches apart in 20 foot single row plots. Rows were spaced 40 inches apart. Potatoes were planted on January 29 and 30 and harvested on May 19 and 20. Standard commercial and cultural practices were used on all tests. At harvest, yield, appearance, and specific gravity measurements were taken. Sub samples from the tests were shipped to Borden (Wise Foods) Berwick, Pennsylvania, for chipping color tests.

Intermediate tests

In test 1, 51 clones were compared to Atlantic and Superior (Table 1). Atlantic yielded significantly less than one selection (K7-1), equaled 23 clones, and yielded more than Superior plus 26 other clones. None of the clones had significantly higher specific gravity than Atlantic. Chip color was generally acceptable at harvest but mostly unacceptable 2 weeks later. Test 2. There were 61 USDA-Beltsville, MD clones compared to Atlantic and Superior as checks. Atlantic was equal to Superior in yield, however, 8 clones had larger yields and 4 had greater values for specific gravity (Table 2). Test 3. Only one selection (B0176-24) had significantly greater yields while 6 had lesser yields. None had greater specific gravity values (Table 3).

Advanced trials

A total of 40 clones and 17 named varieties were in the advanced trials. None of the selections yielded more or had higher specific gravity than Atlantic (statistically). However Atlantic yielded more than Superior, Norchip, and Dunrod along with 22 unnamed clones (Table 4).

Russet trial

Russette yielded more than the other 18 entries in the test. Clone B0956-4 had 68% of its tubers (143 cwt/A) in the 7 oz. or greater range which was significantly higher than the other entries (Table 5).

Florida, Table 1. Results from clones selected for intermediate testing at Hastings, Fl. -- 1992

Clone ^{1/}	Size distribution				Total US-1A	Grand total	Tuber appear- ance ^{3/}	Specific gravity	Chip color ^{4/}	
	% of total US-1A ^{2/}								5/22	6/4
1	2	3	4							
K7-1	53	43	4	0	332	347	6.0	1.070		
AF1377-2	25	46	27	2	268	286	7.0	1.077	4	6
K8-7	77	20	3	0	259	278	6.5	1.084		
AF1424-2	24	42	34	0	258	271	7.5	1.065		
AF1570-1	45	41	12	2	257	274	7.0	1.060		
Atlantic	34	56	10	0	256	276	6.5	1.081	3	5
K6-155	65	32	3	0	256	266	6.5	1.071		
B0996-5	43	47	10	0	249	283	7.5	1.070	8	8
K7-18	71	25	4	0	244	270	7.0	1.075		
AF1566-13	34	49	17	0	235	245	7.5	1.067		
B1022-9	29	47	24	0	234	264	7.5	1.077		
K9-29	60	36	4	0	232	245	7.5	1.078	6	6
AF1556-3	53	40	8	0	230	251	7.0	1.073		
B1022-8	47	47	6	0	230	247	8.0	1.074		
K9-5	32	49	19	0	227	247	7.0	1.074	3	6
K88-29	79	21	0	0	227	252	5.5	1.072		
K7-2	43	36	20	0	219	236	6.0	1.072		
E55-35	72	28	0	0	214	236	5.5	1.082	2	3
B1014-7	57	43	0	0	211	236	7.5	1.083	5	6
B1027-6	33	41	25	0	211	239	7.5	1.076		
K88-24	76	23	1	0	210	231	7.5	1.072	6	6
B1014-10	78	22	0	0	209	239	5.5	1.079		
K8-4	76	24	0	0	206	232	7.5	1.074		
B1003-10	96	4	0	0	190	222	6.0	1.080		
B0972-14	56	42	1	0	187	205	6.5	1.064		
K255-6	57	41	3	0	187	206	6.0	1.081	3	7
AF1521-3	49	48	3	0	186	205	6.5	1.074		
Superior	83	17	0	0	184	197	7.0	1.068		
J84-16	88	12	0	0	177	196	6.5	1.085		
K6-70B	58	39	2	0	176	187	6.0	1.074		

Florida, Table 1. Continued.

Clone ^{1/}	Size distribution				Total US-1A	Grand total	Tuber appear ance ^{3/}	Specific gravity	Chip color ^{4/}	
	1	2	3	4					5/22	6/4
K88-30	92	8	0	0	160	186	5.0	1.072		
B0972-10	94	6	0	0	147	169	6.5	1.066		
AF1515-1	97	3	0	0	145	199	6.0	1.066		
AF1527-3	72	28	0	0	123	141	7.0	1.068		
B1014-15	54	46	0	0	123	200	5.0	1.085	3	3
NY88	81	19	0	0	118	138	8.0	1.083	5	5
B0984-14	88	12	0	0	107	122	7.0	1.072		
AF1528-4	75	25	0	0	105	128	6.0	1.068		
AF1506-2	96	4	0	0	104	125	6.0	1.074		
AF1539-2	100	0	0	0	84	128	5.5	1.070		
K6-23	94	6	0	0	75	87	5.0	1.068		
AF1568-11	47	47	6	0	68	77	6.0	1.079	4	6
LSD (.01)					65	61	1.4	0.007		

^{1/} (R) denotes red-skin clone, otherwise white skin.

^{2/} Size distribution of total US-1A: 1 = 1 7/8-2 1/2"; 2 = 2 1/2-3"; 3 = 3-3/4"; 4 = over 3 3/4".

^{3/} Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

^{4/} Chip color: 1-4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida, Table 2. Results from clones selected for intermediate testing at Hastings, Fl. -- 1992

Clone ^{1/}	Size distribution				Total US-1A	Grand total	Tuber appear ance ^{3/}	Specific gravity	Chip color ^{4/}	
	% of total US-1A ^{2/}								5/22	6/4
1	2	3	4							
B0810-7	42	49	9	0	290	305	5.5	1.084		
B0884-9	58	37	5	0	239	248	8.0	1.071		
B0766-3	55	37	9	0	232	244	6.5	1.079		
B0855-1	66	32	3	0	213	236	7.0	1.068		
B0884-17	83	17	0	0	210	222	6.5	1.084	4	6
B0856-4	40	37	23	0	209	229	6.0	1.078	3	4
B0925-7	32	43	23	2	209	223	7.0	1.075		
B0726-14	58	42	0	0	209	223	5.5	1.074		
B0566-5	94	6	0	0	199	229	7.0	1.083	3	4
B0879-1	91	9	0	0	198	235	6.0	1.075		
B1041-3	89	11	0	0	196	220	6.0	1.071		
B0760-15	65	33	1	0	194	211	7.5	1.076		
B0554-1	42	54	4	0	193	207	7.0	1.074		
B0879-4	94	6	0	0	189	223	7.0	1.073		
B0763-15	39	52	10	0	188	197	7.0	1.084		
B1027-8	57	40	3	0	188	212	6.5	1.079		
B0933-14	39	44	18	0	186	195	8.0	1.081		
B0756-6	57	43	0	0	186	201	8.0	1.081	3	6
B0892-24SG	62	38	0	0	184	195	6.0	1.079	5	7
B0874-13	60	40	0	0	183	201	6.5	1.078	2	4
B0687-14	98	2	0	0	181	213	5.5	1.079		
B0962-13	40	54	5	0	181	188	7.5	1.074		
B0868-3	87	13	0	0	181	205	6.0	1.068		
B0869-1	70	30	0	0	176	199	6.0	1.074	3	6
B0931-5	34	55	11	0	174	182	7.5	1.087		
B0933-7SG	53	39	8	0	172	187	7.0	1.071		
B0753-9	97	3	0	0	170	202	5.0	1.080		
B0870-2	71	29	0	0	170	185	7.0	1.072		
B0874-1	62	33	5	0	170	185	6.5	1.071	2	3
B0717-8	53	47	0	0	169	179	5.5	1.073		

Florida, Table 2. Continued.

Clone ^{1/}	Size distribution				Total US-1A	Grand total	Tuber appear ance ^{3/}	Specific gravity	Chip color ^{4/}	
	% of total US-1A ^{2/}								5/22	6/4
1	2	3	4							
B0944-16SG	91	9	0	0	163	207	7.0	1.074		
B0873-5	79	21	0	0	158	175	7.0	1.082		
Atlantic	79	21	0	0	157	178	6.5	1.081		
B0884-13	83	17	0	0	156	179	6.0	1.066		
B0809-10	80	20	0	0	154	186	7.5	1.081		
B0905-5	68	32	0	0	154	170	5.0	1.083	3	5
B0840-2	83	17	0	0	154	169	5.0	1.067		
B0931-35SG	59	41	0	0	153	165	6.5	1.090		
B0925-1	76	24	0	0	151	170	5.0	1.089	7	5
B0800-12 (R)	84	16	0	0	151	172	8.0	1.063		
B0954-2	43	46	11	0	151	176	4.5	1.082	3	6
B0870-9	86	14	0	0	150	171	5.5	1.073		
B0875-5	62	31	7	0	149	161	7.0	1.070		
B0934-1	87	11	1	0	149	164	5.0	1.091	2	4
B0763-7	81	19	0	0	145	170	6.5	1.090		
Superior	91	9	0	0	140	163	7.0	1.070	3	7
B0933-14SG	59	40	2	0	140	161	6.5	1.063		
B0850-8	93	7	0	0	134	149	7.0	1.073		
B0753-16	91	9	0	0	131	169	5.5	1.083		
B0674-9	56	41	3	0	130	141	7.0	1.068		
B0933-15SG	93	7	0	0	127	160	6.5	1.069		
B0851-4	76	24	0	0	127	144	7.0	1.079		
B0935-1	59	34	6	0	123	136	6.5	1.080	3	4
B0836-8	85	15	0	0	113	135	6.0	1.069	3	6
B0909-25SG	89	11	0	0	111	129	7.5	1.078		
B0925-4	37	40	23	0	109	126	7.5	1.071		
B0933-8	60	33	7	0	99	105	6.5	1.075		
B0871-6	98	2	0	0	97	118	7.0	1.078		
B0871-1	100	0	0	0	97	125	6.0	1.068		
B1036-6	100	0	0	0	71	117	7.0	1.064		
LSD (.05)					49	49	1.5	0.006		

^{1/}(R) denotes red-skin clone, otherwise white skin.

^{2/}Size distribution of total US-1A: 1 = 1-7/8 to 2-1/2"; 2 = 2-1/2 to 3"; 3 = 3 to 3-3/4"; 4 = over 3-3/4".

^{3/}Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

^{4/}Chip color: 1-4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida, Table 3. Results from clones selected for intermediate testing at Hastings, Fl. -- 1992

Clone ^{1/}	Size distribution				Total US-1A	Grand total	Tuber appear- ance ^{3/}	Specific gravity	Chip color ^{4/}	
	% of total US-1A ^{2/}								5/22	6/4
1	2	3	4							
B0176-24	55	43	2	0	229	247	7.0	1.076		
B0178-30	52	42	6	0	183	201	6.0	1.078		
W887	67	33	0	0	176	194	6.5	1.080	4	6
B0622-2	70	29	1	0	165	189	6.5	1.068		
Atlantic	85	15	0	0	162	182	6.5	1.083	3	5
B0179-18	65	29	6	0	160	179	7.5	1.073	4	4
B0615-1 (R)	86	14	0	0	156	180	6.5	1.065		
B0257-12	86	14	0	0	152	172	7.0	1.072		
B0585-1	83	17	0	0	148	169	7.0	1.073		
B0583-2	64	33	3	0	148	173	6.0	1.074		
B0178-34	73	27	0	0	147	161	6.5	1.080	3	4
B0178-35	78	22	0	0	144	163	6.0	1.073		
B0257-9	82	18	0	0	130	147	7.0	1.078	3	4
B0178-34	91	9	0	0	127	153	6.5	1.077	3	4
B0613-2	89	11	0	0	119	141	8.0	1.072		
B0602-1	100	0	0	0	119	163	8.0	1.066		
B0583-8	97	3	0	0	116	147	6.0	1.082	6	7
A80559-2	92	8	0	0	113	139	7.0	1.084	3	5
Superior	96	4	0	0	113	139	6.0	1.063	5	7
B0174-16	85	15	0	0	106	137	6.0	1.071		
B0396-14F	100	0	0	0	104	126	6.0	1.067		
B0257-3	92	8	0	0	90	109	6.0	1.082		
CS7232-4	83	17	0	0	88	102	6.5	1.071		
B0610-2	100	0	0	0	88	129	7.0	1.079		
W870	100	0	0	0	52	79	7.0	1.082	4	6
LSD (.05)					51	47		0.008		

^{1/}(R) denotes red-skin clone, otherwise white skin.

^{2/}Size distribution of total US-1A: 1 = 1-7/8 to 2-1/2"; 2 = 2-1/2 to 3"; 3 = 3 to 3-3/4"; 4 = over 3-3/4".

^{3/}Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

^{4/}Chip color: 1-4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida, Table 4. Results from clones selected for advanced testing at Hastings, Fl. -- 1992

Clone ^{1/}	Size distribution				Total US-1A	Grand total	Tuber appear ance ^{3/}	Specific gravity	Chip color ^{4/}	
	% of total US-1A ^{2/}								5/22	6/4
1	2	3	4							
AF828-5	93	7	0	0	204	231	8.0	1.064		
B9792-8B	78	21	1	0	190	207	7.0	1.075		
LaBelle	88	12	0	0	185	205	6.8	1.077	2	4
Steuben	58	39	3	0	181	201	7.8	1.069	4	6
Atlantic	83	17	0	0	180	204	7.0	1.080	4	4
Red LaSoda (R)	79	20	1	0	179	192	6.5	1.063		
Dunluke	95	5	0	0	178	207	6.5	1.066		
AF828-5	92	8	0	0	176	204	7.8	1.063		
B0564-9	62	36	2	0	170	182	6.0	1.079		
B9792-8B	81	18	1	0	168	181	7.5	1.076	3	3
AF1455-20	83	17	0	0	167	189	7.0	1.078	5	6
B0607-18-BW	81	19	0	0	167	192	6.8	1.073	5	5
Prestile	71	27	1	0	166	182	7.0	1.075		
B0602-12-BW	90	10	0	0	165	193	7.0	1.065	6	6
H26-2	76	23	1	0	164	185	6.8	1.080	3	5
LaChipper	91	9	0	0	163	185	6.5	1.076		
B0607-5	90	10	0	0	162	207	7.0	1.064		
AF875-15	92	8	0	0	161	191	6.8	1.071	4	4
B0607-12-BW	69	29	2	0	161	185	7.3	1.065	5	6
LA12-59 (R)	78	22	0	0	159	183	7.3	1.068		
B0616-1	75	24	1	0	157	173	6.3	1.073		
B0941-43SG	65	33	2	0	156	184	7.0	1.074	3	6
B0599-1	98	2	0	0	155	200	7.0	1.074		
B0726-18	71	29	0	0	155	172	6.3	1.078		
LaRouge (R)	86	14	0	0	153	169	5.7	1.063		
Snowden	97	3	0	0	151	197	7.5	1.076	2	4
B0607-2-BW	96	4	0	0	151	188	6.3	1.062	5	6
Tarago	68	32	0	0	150	164	6.5	1.073	3	4
B0405-4	99	1	0	0	149	180	6.8	1.077		
Sebago	92	8	0	0	147	177	6.8	1.070	5	6

Florida, Table 4. Continued.

Clone ^{1/}	Size distribution % of total US-1A ^{2/}				Total US-1A	Grand total	Tuber appear- ance ^{3/}	Specific gravity	Chip color ^{4/}	
	1	2	3	4					5/22	6/4
Coastal Chip	89	11	0	0	146	174	5.8	1.063	2	4
Sebago	92	8	0	0	145	178	6.8	1.059		
B0602-4-BW	90	10	0	0	140	158	8.0	1.071	4	7
B0256-1	88	12	0	0	137	152	7.5	1.082		
B0602-10	91	9	0	0	135	165	7.8	1.062		
B0607-13	94	6	0	0	132	189	6.8	1.061		
B0405-5-BW	99	1	0	0	130	170	6.7	1.075	3	3
AF1470-17	97	3	0	0	130	168	6.8	1.068		
B0607-27-BW	98	2	0	0	126	175	5.3	1.076	3	5
B0779-10	100	0	0	0	121	151	7.0	1.076		
B0601-6-BW	91	9	0	0	115	158	6.8	1.084	4	5
B0405-6-BW	93	7	0	0	111	141	7.5	1.077	3	6
B0603-14-BW	96	4	0	0	111	146	6.5	1.072	5	6
Superior	99	1	0	0	109	137	6.8	1.067		
Norchip	87	12	1	0	106	133	6.8	1.073		
AF1470-6	84	16	0	0	105	127	6.0	1.059	7	7
B0874-12	100	0	0	0	97	127	6.3	1.078		
J84-8	100	0	0	0	97	123	6.8	1.077	5	6
J33-7	95	5	0	0	96	112	6.5	1.080		
H51-19	90	8	2	0	94	114	7.3	1.077	3	5
B0607-17-BW	6	0	0	0	84	145	6.3	1.078	3	6
Dunrod	99	1	0	0	83	106	5.8	1.065		
B0607-9	98	2	0	0	74	110	6.5	1.067		
B0601-9	100	0	0	0	73	120	7.0	1.065		
B0601-3	99	1	0	0	60	109	6.8	1.065		
B0607-33-BW	100	0	0	0	40	88	6.3	1.080		
LSD (.05)					35	34	1.0	0.007		

^{1/}(R) denotes red-skin clone, otherwise white skin.

^{2/}Size distribution of total US-1A: 1 = 1 7/8-2 1/2"; 2 = 2 1/2-3"; 3 = 3-3/4"; 4 = over 3-3/4".

^{3/}Tuber appearance from 10.0 = most desirable to 0.0 = completely undesirable.

^{4/}Chip color: 1-4 = acceptable; 5 = borderline use; >5 = too dark for use.

Florida, Table 5. Results from russet clones selected for intermediate testing at Hastings, Fl. -- 1992

Clone ^{1/}	Size distribution				Total US-1A	Grand total	Specific gravity
	% of total US-1A ^{2/}						
	1	2	3	4			
Russette	12	55	31	2	246	259	1.080
B0956-4	2	31	54	14	210	217	1.075
B0306-6	15	71	14	0	192	210	1.077
B9922-11	23	68	7	2	192	197	1.074
B0880-15	19	59	18	4	171	192	1.068
B0427-7	42	54	3	0	168	191	1.066
B0647-1	15	61	21	4	159	182	1.068
Nemarus	6	37	47	10	157	171	1.064
B0863-2	37	57	5	0	153	192	1.068
B0649-5	20	58	21	0	152	183	1.075
B0186-3	25	67	6	1	144	178	1.079
B0948-5	10	52	31	7	138	161	1.074
B0329-1	28	61	9	1	137	175	1.069
Coastal Russet	25	71	4	0	133	164	1.072
B0338-2	24	70	6	0	132	160	1.066
B0311-2	34	51	11	4	130	172	1.076
B0880-2	21	63	14	2	94	110	1.068
Belrus	63	37	0	0	79	99	1.079
B0950-6	42	46	3	9	64	86	1.071
LSD (.05)					36	41	0.007

(1) Size distribution of total US1A: 1 = 2 - 5 oz. (strippers); 2 = 5 - 7 oz.; 3 and 4 = over 7 oz.

S. Love, A. Thompson-Johns, M. Ruby, J. Stimpson, J. Pavcek, D. Corsini

Replicated Variety Trials

Potato Variety Trials were conducted in five separate potato growing areas in southern Idaho, including Aberdeen, Kimberly, Parma, Rexburg and Shelley. The trial locations included both experiment station and commercial production sites representing a wide range of soil types and environments. Rexburg and Shelley are commercial production sites with short growing seasons (110 and 120 days, respectively). Aberdeen, Kimberly and Parma are experiment station sites with longer growing seasons (130, 140 and 150 days, respectively).

The trials were planted between April 14 and May 13 and harvested between September 15 and October 4. Management practices employed were common to the respective growing areas and largely conformed to University of Idaho recommendations. Results of the variety trials are summarized in Tables 1-6.

The majority of trials were dedicated to evaluating russet and long-white selections with both fresh market and processing potential. The exceptions were the Rexburg Variety Trial and the Aberdeen Regional Chipping Trial which included clones evaluated for chipping potential. All locations except Shelley had good growing conditions and good average yields. The Shelley location was exposed to brief periods of water stress and exhibited severe early dying symptoms. Results of the variety trials are summarized in Tables 1-7.

Of the russet and long white processing selections, A7961-1, A81473-2, A82119-3, A8495-1, A84180-8, AO82611-7 and COO83008-1 are the most advanced. A7961-1, A8495-1 and A84180-8 are early maturing selections with good processing potential. AO82611-7 and COO83008-1 are selections from the Oregon variety development program are probably destined for release within a few years.

A82119-3 outyielded Russet Burbank at all locations except Parma (Tables 1, 2, 4, 6, 7). It had adequate specific gravity, moderate susceptibility to blackspot and shatter bruise, and excellent fry color out of storage. This clone has exceptional resistance to early dying.

A81473-2 had similar or higher yields than Russet Burbank with the exception of Parma and Rexburg (Tables 1, 2, 4, 6, 7). It had acceptable specific gravity and fry color. A81473-2 was moderately resistant to blackspot bruise and susceptible to shatter bruising.

AO82611-7 had lower yields than Russet Burbank at 2 of 3 locations but performed well otherwise (Tables 4, 6, 7). It had very attractive tubers at all locations. COO83008-1 was one of the lower yielding selections tested, but was very resistant to blackspot bruise and had outstanding fry color scores, especially from 40°F storage (not reported).

A7961-1, A84180-8 and A8495-1 yielded well and had good quality scores, especially considering their early maturity (Table 1, 2, 3, 4, 6, 7). A8495-1 had very poor yield at Parma. This was not due to poor stand, but otherwise the reason is unknown. A7961-1 appears to be a good long russet competitor with Shepody, producing higher yields, better size distribution, and higher specific gravity.

Five advanced chipping selections were evaluated, and all compared well with Atlantic, Gemchip and Norchip for yield and quality (Tables 5, 6). NDO1496-1 is an early maturing clone and had high specific gravity and excellent chip color from 50°F storage. Chipeta (AC80545-1) and NDA2031-2 were the overall highest yielding clones and both had outstanding chip color. NDA2031-2 chipped well directly from 40°F storage (not reported). A80559-2 was susceptible to shatter bruise and developed dry rot in storage.

The trial at Rexburg included two Russet Burbank selections from an induced mutation breeding project. Both RBM161 and RBM297 were selected for heavier, smoother russetting on the skin. Both exhibited better appearance as a result of the selected trait. RBM161 performed identically to the Russet Burbank control. RBM297 had reduced yield, size and specific gravity.

Baked Potato Taste Panel

Five advanced selections were entered into an elaborate taste panel at the county extension facility in Blackfoot, Idaho. Samples were baked in a convection oven then rated by a trained panel of consumers for color, texture, flavor and general appeal. Comparisons were made with Russet Burbank. Shortly after harvest, all five clones were similar to Russet Burbank for color and general appeal. A7961-1 and AO82611-7 had slightly worse texture and A7961-1 had slightly worse flavor. After 5 months storage at 40°F the clone rankings changed. Russet Burbank had the worst color, while A7961-1 and AO82611-7 were significantly better. AO82611-7 still had

worse texture and COO83008-1 had worse flavor. For the most part, all selections were remarkably similar to Russet Burbank for baked quality.

Metribuzin Screening

Seven varieties and twenty-nine breeding selections were tested for response to metribuzin, the most common herbicide used in Idaho. Plots treated with a high rate of metribuzin (1.0 lb a.i./A) were compared with hand-weeded check plots for phytotoxicity and vigor. Percent yield loss in the treated plots was predicted using a model developed previously. Shepody was used as a highly sensitive control and had a 76% yield loss. Russet Norkotah was used as a tolerant control and had no yield loss. Several breeding selections had sufficient yield loss to be of concern including A7961-1, A79216-1, A82119-3, A8390-3, AO83087-10, A82705-1R and AC83306-1. Reds and chippers are historically more sensitive to metribuzin. Five selections proved to be exceptions, including Chipeta, NDTX8-731-1R, A80559-2, NDA2031-2 and NDO1496-1.

IDAHO TABLE 1

1992 ADVANCED YIELD TRIAL - ABERDEEN, IDAHO

Clone	Total Yield	U.S. No. 1's		< 4 oz	Culls & U.S.No. 2	Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Fry ³ Color		
		Yield	%								
	-----cwt/acre-----			----- % -----							
A82119-3	498	473	95	49	40	3	2	1.081	3	3.6	0.8
A86102-6	484	426	88	19	53	10	2	1.082	0	2.3	2.5
LEMHI R.	476	414	87	32	43	8	5	1.082	3	4.8	1.3
A84180-8	453	421	93	30	53	4	2	1.080	0	3.6	1.1
A81473-2	438	412	94	50	38	3	3	1.080	0	3.4	1.6
R. BURBANK	426	354	83	18	50	7	10	1.082	3	3.5	1.0
A8603-20	426	320	75	35	31	4	21	1.084	0	3.3	2.2
RANGER R.	416	399	96	41	49	3	1	1.084	0	4.2	0.9
A81386-1	390	355	91	21	56	9	1	1.076	0	3.9	0.5
A84420-5	380	334	88	2	47	12	0	1.108	0	3.5	0.3
A8519-4	373	302	81	12	50	12	7	1.088	14	3.1	0.6
A84118-3	344	316	92	17	53	8	0	1.088	0	2.5	1.0
Mean	425	377	89	28	47	7	5	1.085	2	3.5	1.1
LSD (0.05)	49							0.003		0.4	0.5

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 2

1992 ADVANCED YIELD TRIAL - KIMBERLY, IDAHO

Clone	Total Yield	U.S. No. 1's		6 to 12 oz		<4 oz		Culls & U.S.No. 2	Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Fry ³ Color
		Yield	%	>12 oz	%	%	%					
	-----Cwt/acre-----											
A81473-2	547	503	92	58	30	4	4	4	1.085	5	2.1	1.2
A86102-6	511	450	88	30	47	7	7	5	1.085	0	1.6	2.5
A82119-3	500	430	86	47	32	7	7	7	1.084	0	3.1	0.8
RANGER R.	492	418	85	57	23	2	2	13	1.086	0	3.5	1.6
R. BURBANK	476	338	71	32	33	6	6	23	1.077	3	2.6	1.4
LEMHI R.	473	412	87	36	41	7	7	6	1.082	3	4.0	1.4
A81386-1	469	431	92	51	34	4	4	4	1.076	0	3.2	0.6
A8603-20	468	318	68	33	27	5	5	28	1.084	0	2.3	3.1
A84180-8	454	404	89	36	46	5	5	6	1.077	0	2.4	2.0
A8519-4	447	358	80	20	45	11	11	9	1.094	3	2.1	0.6
A84118-3	424	377	89	34	46	7	7	4	1.094	0	2.2	1.3
A84420-5	406	329	81	23	48	9	9	9	1.104	0	2.9	0.5
Mean	472	397	84	39	37	6	6	10	1.086	1	2.7	1.4
LSD (0.05)	64								0.003		0.6	0.6

¹ Hollow heart was measured by cutting tubers >12 oz.

² 1-5 scale with 1 = resistant, 5 = susceptible.

³ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45 °F.

1992 TRI-STATE POTATO VARIETY TRIAL - ABERDEEN, IDAHO

Clone	Total Yield	U.S. No. 1's		<4 oz	Culls & U.S.No. 2	Specific Gravity	Hollow ¹		Blackspot ²	Shatter ³	Fry ⁴
		Yield	%				Heart	- % -			
		-----cwt/acre-----		----- % -----							
RUSSET BURBANK	531	349	66	10	7	1.090	3		2.7	3.6	0.8
LEMHI RUSSET	554	436	79	17	10	1.091	0		4.9	4.4	0.8
A8495-1	474	382	81	10	12	1.091	0		2.9	3.2	1.0
A81386-1	429	345	80	20	11	1.083	0		3.3	3.7	0.8
A79180-10	406	369	91	29	6	1.094	0		3.1	3.4	1.5
A080432-1	320	255	80	9	16	1.092	0		2.7	3.5	1.7
A081775-3	409	337	82	10	12	1.088	0		2.6	3.3	1.3
A08478-1	552	450	82	29	10	1.091	0		3.2	3.4	1.0
A79216-1	354	297	84	15	13	1.088	25		3.5	2.8	1.8
A8337-2	521	425	82	12	17	1.090	0		3.1	3.3	1.6
A085031-7	627	542	86	32	7	1.086	0		2.0	3.3	2.0
A84180-8	469	395	84	19	7	1.086	0		2.3	3.4	1.4
Mean	470	382	81	18	11	1.089	2		3.0	3.4	1.3
LSD (0.05)	44	43				0.003			0.4	0.3	0.3

¹ Hollow heart was measured by cutting tubers > 12 oz.

² 1-5 scale with 1 = resistant, 5 = susceptible.

³ 1-5 scale with 1 = resistant, 5 = susceptible.

⁴ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 4

1992 POTATO VARIETY TRIAL - PARMA, IDAHO

Clone	Total Yield	U.S. No. 1's		Culls &		Specific Gravity	Hollow ¹ Heart	Fry ² Color	Sugar ³ Ends
		Yield	%	> 12 oz	6 to 12 oz	< 4 oz	U.S.No. 2		
	-----cwt/acre-----				%			-%-	-%-
RUSSET BURBANK	578	356	62	15	32	14	25	1.082	10
LEMHI RUSSET	469	378	81	29	41	9	11	1.087	33
A81473-2	475	407	86	33	44	6	9	1.085	5
A82119-3	423	350	83	33	42	6	11	1.092	13
COO83008-1	497	378	76	53	20	3	21	1.087	25
FRONTIER RUSSET	508	426	84	35	39	7	9	1.082	10
SHEPODY	532	393	74	39	28	4	22	1.077	3
A8495-1	295	223	76	32	34	11	13	1.084	15
A81386-1	575	486	85	28	41	8	8	1.084	3
A7961-1	539	450	83	33	39	7	10	1.083	3
AO82611-7	510	389	76	16	40	14	10	1.090	0
RANGER RUSSET	619	431	70	19	39	7	24	1.094	0
Mean	502	389	78	30	37	8	14	1.085	10
LSD (0.05)	122	112						0.005	
								0.7	1

¹ Hollow heart was measured by cutting tubers > 12 oz.² USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.³ Percent of tubers producing fries with ends rated 3 + and at least 1 full point darker than the remainder of the fry.

IDAHO TABLE 5

1992 REGIONAL CHIPPING POTATO TRIAL - ABERDEEN, IDAHO

Clone	Total	U.S. No. 1's				Culls &		Specific Gravity	Hollow ¹ Heart	Blackspot ²		Shatter ³ Bruise	Chip ⁴ Color
	Yield	Yield	%	>12 oz	6 to 12 oz	<4 oz	U.S.No. 2						
		-----cwt/acre-----	----- % -----										
ATLANTIC	422	382	91	19	57	9	0	1.097	0	2.2	4.1	2.1	
GEMCHIP	441	399	90	25	54	9	1	1.085	5	3.7	3.4	2.3	
NORCHIP	394	266	68	2	30	31	2	1.081	0	2.4	3.6	2.8	
CHIPETA	533	499	94	38	51	4	2	1.085	3	2.8	4.2	2.0	
A80559-2	510	442	87	18	47	12	2	1.106	3	2.7	3.9	1.4	
AC83306-1	560	495	88	30	48	8	4	1.090	0	2.6	3.1	1.5	
NDA2031-2	555	444	80	12	47	18	2	1.080	0	1.7	3.4	1.3	
NDO1496-1	440	325	74	5	43	26	1	1.094	0	2.4	4.0	1.0	
Mean	482	406	84	19	47	15	2	1.090	1	2.5	3.7	1.8	
LSD (0.05)	36	50						0.003		0.4	0.7	0.5	

¹ Hollow heart was measured by cutting tubers > 12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ 1-5 scale with 1 = resistant, 5 = susceptible.⁴ Chip color from tubers stored at 50 degrees, rated on a 0-4 scale with 0 = light, 4 = dark.

1992 POTATO VARIETY TRIAL - REXBURG, IDAHO

Clone	Total Yield	U.S. No. 1's				Culls &		Specific Gravity	Hollow ¹ Heart	Blackspot ² Bruise	Shatter ³ Bruise	Fry ⁴ Color
		Yield	%	> 12 oz	6 to 12 oz	< 4 oz	U.S.No. 2					
-----cwt/acre----- % -----												
Russets & Processors												
RUSSET BURBANK	452	230	51	6	25	21	28	1.086	33	3.8	3.5	1.7
LEMHI RUSSET	494	342	69	10	40	18	13	1.094	2	4.8	3.9	1.8
FRONTIER RUSSET	337	229	68	7	40	23	9	1.088	12	3.0	2.9	2.5
RANGER RUSSET	441	308	70	15	35	16	15	1.086	0	4.4	3.6	2.3
SHEPODY	405	283	70	26	32	11	20	1.081	2	2.9	3.4	2.6
A7961-1	445	283	64	18	26	16	21	1.090	0	4.2	2.6	2.3
A8174-2	430	253	59	3	31	29	12	1.073	0	3.3	4.0	1.9
A81386-1	441	334	76	16	43	15	10	1.083	2	4.5	3.2	1.4
A81473-2	393	302	77	10	45	19	4	1.085	0	2.3	4.2	1.8
A82119-3	463	319	69	19	36	14	17	1.087	0	3.6	3.4	2.1
COO83008-1	342	267	78	10	44	15	8	1.089	5	2.7	3.7	1.9
AO82611-7	465	312	67	12	38	16	17	1.086	8	3.5	3.4	3.1
A8495-1	401	285	71	16	36	18	10	1.089	3	3.9	3.5	1.4
RBM161	452	229	51	4	28	20	29	1.084	27	3.6	3.5	1.9
RBM297	348	148	43	1	18	33	24	1.077	2	3.6	3.0	1.6
SISKYOU	342	248	73	21	37	12	16	1.091	0	3.1	2.6	2.3
Chippers												
ATLANTIC	485	367	76	17	42	12	12	1.099	13	2.4	3.6	0.8
GEMCHIP	429	369	86	26	48	9	5	1.087	13	3.0	3.3	1.0
NORCHIP	464	281	61	2	39	17	22	1.082	0	2.7	3.6	0.8
CHIPETA	441	359	81	14	49	12	7	1.088	0	3.3	3.1	0.8
A80559-2	462	319	69	9	37	24	7	1.099	2	2.2	3.6	0.8
NDA2031-2	525	343	65	6	33	27	8	1.085	2	2.3	3.1	0.6
NDO1496-1	438	323	74	12	38	22	4	1.092	3	2.2	3.3	0.5
Mean	430	293	68	12	37	18	14	1.087	6	3.3	3.4	1.6
LSD (0.05)	64	62						0.004		0.5	0.3	0.5

¹ Hollow heart was measured by cutting tubers >12 oz.² 1-5 scale with 1 = resistant, 5 = susceptible.³ 1-5 scale with 1 = resistant, 5 = susceptible.⁴ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 7

1992 IDAHO POTATO VARIETY TRIAL - SHELLEY, IDAHO

Clone	Total Yield	U.S. No. 1's		<4 oz	Culls & U.S.No. 2	Specific Gravity	Hollow ¹		Blackspot ² Bruise	Shatter ³ Bruise	Fry ⁴ Color
		Yield	%				Heart	-%			
		-----cwt/acre-----	----- % -----								
RUSSET BURBANK	222	70	32	0	21	1.075	17		2.7	3.1	1.1
LEMHI RUSSET	232	127	55	3	4	1.083	0		3.6	4.3	1.0
A81473-2	308	189	61	3	4	1.083	0		1.6	3.8	0.8
A82119-3	249	161	65	12	4	1.081	0		2.5	3.5	0.8
COO83008-1	191	102	53	3	2	1.091	0		1.6	3.5	0.8
FRONTIER RUSSET	187	82	44	1	4	1.081	0		2.2	2.5	1.2
SHEPODY	215	121	56	2	7	1.079	0		2.8	3.6	1.6
A8495-1	215	83	39	0	2	1.087	0		3.1	3.4	0.8
A81386-1	243	95	39	2	8	1.077	0		3.2	3.7	0.6
A7961-1	230	110	48	4	8	1.085	0		4.0	2.8	1.3
A082611-7	186	65	35	0	5	1.084	0		3.0	3.2	1.5
RANGER RUSSET	278	151	54	6	8	1.084	0		3.9	3.6	1.4
A8174-2	252	91	36	1	4	1.073	0		2.8	3.0	1.3
Mean	231	111	47	3	6	1.082	1		2.8	3.4	1.1
LSD (0.05)	35	36				0.002			0.3	0.3	0.3

¹ Hollow heart was measured by cutting tubers > 12 oz.

² 1-5 scale with 1 = resistant, 5 = susceptible.

³ 1-5 scale with 1 = resistant, 5 = susceptible.

⁴ USDA fry grade score with lower score indicating lighter color; potatoes stored at 45°F.

IDAHO TABLE 8. Baked potato taste panel results for advanced breeding selections.¹

Clone	At harvest			General	After 5 Months Storage (40°F)			
	Color	Texture	Flavor		Color	Texture	Flavor	General
RUSSET BURBANK	7.0 a	6.7 a	6.9 a	6.8 a	6.3 b	6.1 a	6.1 ab	6.0 ab
A7961-1	7.2 a	6.2 b	6.3 b	6.5 a	6.8 a	5.7 ab	5.7 abc	5.9 ab
A82119-3	7.1 a	6.4 ab	6.7 ab	6.5 a	6.7 ab	6.1 a	6.0 ab	6.1 ab
A8495-1	7.0 a	6.6 ab	6.7 ab	6.6 a	6.7 ab	5.9 ab	6.2 a	6.2 a
A082611-7	7.0 a	6.2 b	6.5 ab	6.4 a	6.8 a	5.5 b	5.6 bc	5.8 ab
COO83008-1	6.8 a	6.7 a	6.5 ab	6.5 a	6.6 ab	5.8 ab	5.4 c	5.6 b

¹ Evaluations were made on coded, unknown baked potato samples by trained panelists with approximately 80 tests conducted per clone.

Each sample was rated on appeal for color, texture, flavor, and general appeal. Ratings were based on a 1-9 scale with 9 = best.

Means were separated using Tukey's Studentized Range and means with the same letter are not significantly ($p = .05$) different.

IDAHO TABLE 9. Reaction of Potato Clones to Metribuzin.¹

Clone	Plant Injury 21 Days Following Application	Predicted Yield Reduction Due to Injury ²
	-----%-----	
Named Varieties		
Atlantic	65	37
Chipeta	13	0
Lemhi Russet	8	0
Red LaSoda	40	17
Russet Burbank	13	0
Russet Norkotah	0	0
Shepody	95	76
Russet Selections		
A74212-1E	0	0
A7961-1	50	30
A79180-10	10	0
A79216-1	55	33
A81286-1	20	4
A81386-1	23	4
A81473-2	23	5
A81478-1	0	0
A82119-3	33	15
A8337-2	18	0
A8390-3	33	15
A8495-1	15	0
A84180-8	0	0
AC75430-1	13	0
AO80432-1	35	10
AO82611-7	5	0
AO83037-10	33	16
AO8478-1	23	6
AO84275-3	18	0
ATX6-84378-1Russ	28	12
CO82142-4	25	10
COO83008-1	15	0
NDO2904-7	30	11
Red Selections		
A82705-1R	40	20
NDTX8-731-1R	25	7
Chipping Selections		
A80559-2	20	0
AC83306-1	50	28
NDA2031-2	20	4
NDO1496-1	10	0

1 Metribuzin applied postemergence (8-12 inch tall plants) at a rate of 1.0 lb a.i./A (17.5 gpa, 30 psi).

2 Predicted yield reduction is expressed as percent loss compared to untreated plots and was calculated using the model $[1 - (1.142 + 0.176 (\text{Log} (\text{plant height treated}/\text{plant height control})) - 0.00796 (\text{plant injury}))] \times 100$.

MAINE -- 1992

Alvin F. Reeves, Robert B. Long, Garland S. Grounds, and Arnold A. Davis.

Potato Breeding

Objectives: The development of new potato varieties of three types: 1. high-yielding, round, white, fresh market varieties with good table qualities and resistance to scab; 2. round white chipping varieties with high dry matter and low sugars, especially after long term cold storage; and 3. russet varieties with high yield and high dry matter suitable for french fry processing and fresh market.

Seed and seedling production. A total of 29 parent plants were intercrossed in 67 different combinations to produce 108,025 seeds. An additional 416,000 seeds were obtained from 22 field plantings. Greenhouse plantings of true seeds yielded 69,231 seedlings from which 37,894 tubers were harvested.

Seedling selection. A total of 224 (0.9%) new selections were saved from 25,004 single hills. From the 226 12-hill plots, 40 (17.7%) were saved for further testing. Forty 60-hill plots, and 110 advanced selections were maintained and tested.

Selection Screening Disease tests. In cooperation with Drs. Franklin Manzer, Richard Storch, Bill Brodie, Robert Goth, Gilbert Banville, John Wells, and Simeon Leach, a number of selections were tested for resistance to several diseases. All tests were inoculated either directly or on spreader rows within the plots. Results were as follows: 20 of 125 selections tested were resistant to late blight; 9/133 to early blight; 30/122 to acid scab; 44/125 to common scab; 63/125 to verticillium; 107/125 to net necrosis; 29/53 to golden nematode; 9/22 to Fusarium roseum 'Sambucinum'; and 4/8 to soft rot.

Physiological disorders. Additional tests for physiological disorders showed 26 of 37 resistant to hollow heart; 18/25 to blackspot bruising; and 3/8 to shatter bruising.

Chip tests. After processing in December, February, and April, from six different storage temperatures, 14 entries had better average chip color than Monona: MaineChip, AF 1424-7, AF 1452-

28, AF 1433-4, Somerset, AF 1424-6, ND 860-2, CS 7232-4, AF 1466-36, AF 1556-6, AF 1433-5, AF 1379-5, Atlantic, and AF 1568-6.

Processing and Cooking tests. Terry Work (Food Sciences Department of the University of Maine, Orono) conducted french fry tests of eight selections, and cooked quality tests for seven selections from 1991 plantings. For french fry quality, five selections were equal to the two checks in all qualities. Two selections had poorer color and one was poor in texture. In the baked product tests, five of the seven round white selections were higher than the standards in overall acceptability. One selection was rated better than Katahdin in flavor.

Commercial Trials

Along with MaineChip, Portage and Prestile, four numbered selections were grown on commercial farms in 1992 (AF 828-5, AF 1060-2, CS 7232-4, and AF 875-15). The 1992 season was the most unusual in many ways: a warm spring was followed by a wet, cold summer, then a warm dry fall. These conditions led to several problems including fusarium rot and storage breakdown, powdery scab, hollow heart and growth cracks, purple streaks and sunburn. Although the finger was pointed at Allegany for early storage breakdown, and Norwis for hollow heart, all varieties suffered from some problem this year.

Chipping selections:

MaineChip (AF 875-16; AF 186-2 x AF 84-4) was named in 1991. It is a high dry matter, cold-chipping variety, with yields of marketable size equal to Snowden. Several acres of first generation seed will be grown on commercial farms in 1993. One commercial lot in 1992 had severe powdery scab infection; hollow heart has been bad on occasion; and mosaic shows up late in this variety.

AF 875-15, a sibling of MaineChip, has better yields than MaineChip and equal dry matter, but is not as good after cold storage. It is a good chipper from the field and does not show the heat necrosis that Atlantic does. Hollow heart is very rare, but there were several growth cracks in some 1992 plantings.

CS 7232-4 (Wauseon x B 6503-5) is still being grown by one commercial chipping grower. It does

have excellent chip color from storage, but yields and gravity are too low. It will probably never be named.

Round white table varieties:

Portage (CS 7697-24; Raritan x BR 6831-5) is an early maturing variety with high yields and low gravity. It was named in 1992. Its advantage over Superior is better resistance to verticillium wilt and rhizoctonia. Disadvantages are susceptibility to scab and purple streaking.

Prestile (CS 7635-4; BR 6293-12 x B 5421-3) was named in 1991. It is a late maturing variety with relatively high yields and dry matter. It has a nice appearance and will store late if given proper oxygen in storage. It is susceptible to heat necrosis and to black center in storage. Another disadvantage is shatter cracking or air cracking when given too much fertilizer.

AF 828-5 (BR 6317-21 x CC 14-3a) has been named '**St.Johns**'. It is a late maturing variety with high yields and good disease reactions. It is resistant to golden nematode and the corky ring spot virus, and does well all along the east coast. Its disadvantages are as yet unknown.

AF 1060-2 (AF 431-9 open pollinated) is even slightly higher yielding than St.Johns, but is more susceptible to scab. It has also shown purple streaks on occasion.

Maine

G.A. Porter, J.A. Sisson, and B. MacFarline
University of Maine

Introduction

Forty-eight potato varieties and clones were tested at Aroostook Farm, Presque Isle, Maine, as part of the NE107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast). The primary objective of this trial is to determine performance, quality, and storage characteristics of promising potato clones and new varieties in Maine.

Methods

Single-row plots, 25 feet long were hand planted on May 13 (earlies, reds, lates, russets) and May 19 (mediums), 1992, using a randomized complete block design and four replications. The seedpiece spacing used for each line is listed in subsequent tables. Plots were located on Caribou loam soils typical of the area. Soil nutrient levels were medium-high to high with soil pH ranging from 5.5 for the medium trial to approximately 6.0 for the remaining trials. Except for the medium maturity trial, which was cropped to barley green manure during the previous year, the varieties were grown following plowed down timothy/clover sod. The early and red trials were fertilized with 960 lbs/A of 14-14-14, banded at planting. Late, medium, and russeted varieties received 1100 lbs/A of the same fertilizer blend. Metribuzin and paraquat (0.38 lbs ai/A each) were applied on June 2 for weed control. Cultural practices were similar to those used on commercial farms in the area, and varieties were grouped so that separate tests could be vine killed and harvested based on maturity classification. Specific gravity was determined at harvest using the weight-in-air/weight-in-water method. Hollow heart ratings indicate the number of hollow tubers observed per 40 large tubers examined. Chip color evaluations were conducted from November 30 to December 2, following storage at 50°F. Chips were fried at 350° F until bubbling stopped and evaluated using an Agtron M35, calibrated with the black "0" disk = 0 and the white "90" disk = 90. Chips were crushed and reported values are means from four replicates per variety.

Each sample was read three times and was thoroughly mixed between readings.

Results:

General Growth and Plant Stands.

Most of the varieties produced excellent stands in these studies. Only two lines, AF1302-1 and AF1331-2, had stands that averaged less than 88% of the targeted stand. The majority of varieties grew vigorously during 1992 due to cool temperatures and evenly distributed rainfall. Rainfall for May, June, July, and August totaled 1.51, 4.22, 3.68, and 5.05 inches, respectively. Only AF1302-1, AF1331-2, and BelRus produced small plants and incomplete ground cover. These conditions apparently caused the formation of many tubers per plant in most varieties and, consequently, tuber size was quite small. On average, yields and specific gravities were higher than usual. Very few disease problems were observed during 1992. Several plots of Russet Norkotah, MN12567, and ND1538-1Rus senesced during late August, possibly due to early dying.

Early Maturity Trial. Superior was by far the most productive line in the early maturity test (Maine Table 1). Norchip and NYE55-44 were significantly lower yielding than Superior, but more productive than AF1302-1 and AF1331-2. Tuber size was quite small for all lines, particularly Norchip and NYE55-44. There were no serious external defects in any of the lines; however, NYE55-44 and Superior tubers were the most uniform in appearance and most attractive (Maine Table 2). NYE55-44 produced excellent chip colors from December storage, and specific gravity was excellent for this line as well. Norchip also produced light-colored chips and tubers with excellent specific gravity. Although yields and tuber size of NYE55-44 were disappointing during 1992, it produces exceptionally light chips from December and February storage and is promising as an early chipper.

Red-Skinned Trial. Three red-skinned varieties were compared with Norland and Chieftain standards (Maine Tables 1

and 2). Chieftain and NDT9-1068-11R were the highest yielding lines in these trials. Norland, LA12-59, and ND2224-5R produced significantly lower yields than the two leaders. LA12-59 had exceptionally high specific gravity for a red-skinned potato. NDT9-1068-11R had significantly lower specific gravity than the other lines. Tuber size was exceptionally small for ND2224-5R, Chieftain, and Norland. Tubers of all lines were attractive during 1992 with NDT9-1068-11R, Chieftain, and Norland producing especially attractive tubers. NDT9-1068-11R produced high yields of attractive, oblong tubers and was the most impressive test line included in this trial.

Medium Maturity Trial. Most of the test clones were similar to Kennebec and Atlantic in total yields. Only Calchip, MaineChip, and FL1625 produced significantly lower total yields than both standards (Maine Table 3). B0256-1 produced significantly higher marketable yields than the two standards, while marketable yields of Calchip, MaineChip and FL1625 were significantly lower than the standards. Kennebec, MaineChip, AF875-15, FL1533, FL1625 and NC012-19 had excessive percentages of growth-cracked tubers in this experiment (Maine Table 4). B0257-9 produced the most attractive tubers, but many had air cracks. Tubers of Calchip, MaineChip, Snowden, AF875-15, FL1533, FL1625, and NC012-19 were particularly unattractive due to growth cracks, poor shape and color, small size and/or poor skin color. Only Kennebec, Yukon Gold, B0256-1, FL1533, and FL1625 sized well. NC012-19 had excessive levels of hollow heart and hollow heart was also present at fairly high levels in Atlantic, Calchip, and FL1625.

Several promising chipping selections appeared in this trial. Acceptable chip colors were obtained from Atlantic, Gemchip, MaineChip, Snowden, Spartan Pearl, AF875-15, B0257-9, FL1533, FL1625, MN13540, NC012-18, NC012-19, and NY87. Chip colors for MaineChip and FL1533 were particularly outstanding. Chip colors were poor for Calchip, Yukon Gold, and B0256-1. Only Kennebec, Gemchip, Spartan Pearl, Yukon Gold, FL1533, MN13540, and NY87 had specific gravities that were significantly lower than those of Atlantic. Calchip had particularly high specific gravity, perhaps excessively so. Based on yields, tuber

appearance, chip color, and specific gravity, the best lines in this test for overall chipping performance were B0257-9 and NC012-18. B0257-9 displayed some air cracking during 1992 and had been low yielding in our trials prior to 1992. MaineChip has consistently produced excellent quality chips from storage and high specific gravity over the past four years; however, Snowden performed better than MaineChip in most characteristics during 1992. Spartan Pearl, Yukon Gold, and B0256-1 all performed well for tablestock use in this test.

Late Maturity Trial. Allegany, AF828-5, AF1060-2, and NY84 produced very high yields in this trial (Maine Table 5). Monona, Norwis, and B0178-34 were the three lowest yielding lines in the trial. Similar groupings were also observed for marketable yields. Katahdin, AF1060-2, B0175-20, and B0178-34 had fairly large tuber size in this trial. Although there were few external tuber defects in these lines (Maine Table 6), tuber appearance of NY84 and Norwis were rated poor due to uneven size (both lines), pear-shaped tubers (NY84), and scab (Norwis). Norwis also displayed considerable levels of hollow heart. Tubers of Katahdin, Monona, AF1060-2, and MN12823 were rated particularly bright and attractive.

Monona, Norwis, B0175-20, B0178-34, MN12823, and NYE11-45 produced excellent chip colors from December storage. February chip colors have also been good in past trials with B0175-20, B0178-34, and NYE11-45. Specific gravities of B0175-20 and B0178-34 were 1.098 or higher, while most other lines had moderate specific gravities. Based on this growing season and results from the past two years, B0175-20 is the best chipping prospect in this maturity class.

Russet-Processing Trial. Castile, Russet Burbank, MN12567, W1005Rus, ND671-4Rus, and ND1538-1Rus were high yielding in this trial (Maine Table 7). B9922-11, Eide Russet, and Russet Norkotah were moderate yielding, while BelRus produced the lowest yields. None of the lines produced sufficient large-sized tubers. Eide Russet, Russet Norkotah, and MN12567 tubers were exceptionally small. Russet Burbank, BelRus, and W1005Rus were the most elongated in shape, while those of MN12567 were round, and those of Russet Norkotah were not well elongated (Maine

Table 8). MN12567 and Castile were white-skinned. All of the russeted lines displayed attractive russeting except for Russet Burbank and BelRus. Tubers of Castile, B9922-11, ND1538-1Rus, and W1005Rus were rated particularly attractive. Russet Burbank had a very high incidence of hollow heart in this trial.

Only Eide Russet, Russet Norkotah, MN12567, ND671-4Rus, and ND1538-1Rus had specific gravities below 1.090. W1005Rus displayed a very light fry color from December storage and fried well from December and February storage in 1991. Fry colors of BelRus, Castile, B9922-11, and MN12567 were also equal to, or lighter, than Russet Burbank. Considering tuber size, marketable yields, and appearance, ND671-4Rus, and W1005Rus were the best prospects for russet tablestock use. B9922-11 and ND1538-1Rus also performed well for this use. Based on yield, fry color, tuber size, and specific gravity, Castile and W1005Rus had the best potential for french fry utilization. Late maturity is a disadvantage for W1005Rus.

Storage Evaluations. Limited data on storage and processing characteristics were collected from 46 varieties and clones grown during the 1991 growing season (Maine Tables 9 and 10). French fry quality of six selections was evaluated under simulated processing conditions (Maine Table 9). B9922-11 produced french fries that were rated superior to Russet Burbank in texture. Considering fry color, uniformity, and texture, only B9922-11 was judged equal to Russet Burbank in french fry quality.

Chip colors from 50°F storage in February were acceptable for most lines with anticipated chipping potential (Maine Table 10). Lines with outstanding chip color from 50° February storage were NYE55-44 (early test), MaineChip and NYE57-13 (medium trial), NYE55-35 (late test), and W1005Rus (russet/processing trial). MaineChip, Norchip, Saginaw Gold, NYE11-45, NYE55-44, and NYE57-13 also produced acceptable chips directly from 45°F storage. NYE55-44 was particularly outstanding. Although none of the selections produced acceptable chips directly out of 38°F storage, the following lines reconditioned well from 38°F storage: B0257-3 (early test); MaineChip, AC Novachip, NYE11-45, NYE57-13 and NY85

(medium test); B0175-20, B0178-34, and NYE55-35 (late test).

Norland, Russet Burbank, Russet Norkotah, AK-3-79-235-81, ND2224-5R, NYE55-35, and NYE57-13 had after-cooking darkening scores that were considerably poorer than Katahdin. Washed appearance ratings were particularly outstanding for Allegany, Atlantic, Chaleur, Chieftain, Norland, Russet Norkotah, AK-3-79-209-81, B9922-11, NYE55-27, NYE55-35, and NY78. Most of the test lines had very high levels of silver scurf on their tubers; however, Chaleur, Gemchip, Kennebec, B0257-3, ND671-4Rus, NYE55-27, and NYE57-13 had relatively low levels of silver scurf. Norland, AF1302-1, AF1331-1, B0178-34, and NYE55-44 had greater than 20% of tubers infested with black scurf. Tuber dormancy was exceptionally short for Gemchip, Red Gold, B0256-1, and NY84. Dormancy of Allegany, Chaleur, Chieftain, Kennebec, Russet Burbank, AK-3-79-209-81, and NYE57-13 was quite long. Selections with very low weight loss (3% or less) from 38°F storage were Reddale, Atlantic, Kennebec, AC Novachip, AF875-15, B0257-9, B9922-11, ND2224-5R, NYE55-27, and NYE57-13. Selections with very low weight loss (approximately 9% or less) from 50°F storage were Allegany, Kennebec, LaBelle, Russet Burbank, B0257-9, B9922-11, and NYE11-45. Katahdin, MaineChip, Norland, Red Gold, AF845-11, AF875-15, B0178-34, and NY78 had relatively high weight loss at 50°F.

Overall Summary. Selections from the 1992 NE107 trials that appear particularly promising as late-season, tablestock round-whites are AF828-5 and AF1060-2. Spartan Pearl and B0256-1 performed well in 1992 for mid-season tablestock use. The latter had not been very high yielding in previous tests. MaineChip, NYE55-44, and B0175-20 have been our most promising chipping lines over the past few years. B0178-34, B0257-9, and NC012-18 performed well in 1992. B0257-9 had been low yielding in our trials prior to 1992. Commercial-sized storage trials are needed to judge the seriousness of weight loss problems that we have observed for B0178-34 and AF875-15. ND671-4Rus and W1005Rus were the best prospects for russet tablestock use. B9922-11 and ND1538-1Rus also performed well for russet tablestock use. Castile and W1005Rus had the best overall potential for french fry utilization.

Maine Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for early maturing and red-skinned varieties grown at Presque Isle, Maine - 1992.

Variety	Total yield cwt/A	Mkt. Yield cwt/A	% of std.	% Stand (spacing) ²	Size Distribution by Class ¹ (%)						Size Distribution(%)		Specific Gravity
					1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in.	
Early Test- 100 days													
Superior (std)	342	316	100	97(10)	6	29	40	22	3	0	94	25	1.088
Norchip	289	238	75	97(10)	12	45	34	10	0	0	88	10	1.090
AF1302-1	226	195	62	73(10)	6	27	40	25	1	0	94	26	1.082
AF1331-2	238	208	66	77(10)	5	13	41	39	2	0	95	40	1.079
NYE55-44	284	261	82	98(10)	6	43	36	15	0	0	94	15	1.092
Waller Duncan													
LSD (K=100)	32	33									10		0.003
Red-skinned Test - 110 days													
Chieftain (std)	474	442	100	99(8)	6	35	42	15	2	0	94	17	1.081
Norland	333	311	70	92(8)	7	40	33	20	1	0	93	21	1.082
LA12-59	359	331	75	94(8)	5	23	28	35	9	0	95	44	1.096
ND2224-5R	338	297	67	95(10)	11	53	26	9	1	0	89	10	1.079
NDT9-1068-11R	455	421	95	89(8)	4	21	34	35	6	0	96	41	1.075
Waller Duncan													
LSD (K=100)	45	49									12		0.003

¹Size classes for all varieties: 1=1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4".

²Inches between seedpieces noted between parentheses.

Maine Table 2. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for early maturing and red-skinned varieties grown at Presque Isle, Maine - 1992.

Variety	Plant Data ¹		Tuber Data ¹		Appear- ance	Tuber Defects (%)			Hollow Heart Rating ²	Chip Color ³	
	Size 7-22	Vine Matur. at 8-19	Matur. at Vinekill	Shape		Total	Sun- burn	Mis- shapen			Growth cracks
<u>Early Test- 100 days</u>											
Superior (std)	7	2	4	2	7	1.8	0.5	0.7	0.6	0	51
Norchip	6	3	5	1	6	6.6	1.7	3.7	1.2	0	61nu
AF1302-1	4	4	6	4	5	8.8	5.9	2.6	0.2	2	50
AF1331-2	4	5	7	5	5	8.3	6.7	0.9	0.7	0	43
NYE55-44	7	5	7	2	8	2.6	1.4	1.0	0.3	0	67
<u>Red-skinned Test - 110 days</u>											
Chieftain (std)	8	7	6	3	7	0.4	0.2	0.0	0.2	0	
Norland	6	2	2	3	7	0.4	0.1	0.2	0.0	0	
LA12-59	7	6	6	1	6	3.1	0.5	2.1	0.5	1	
ND2224-5R	6	3	3	5	6	1.2	0.3	0.6	0.3	0	
NDT9-1068-11R	6	7	6	3	8	4.2	1.7	1.4	1.0	0	

¹See standard NE107 rating system for key to codes.

²Unless otherwise noted, hollow heart rating equals number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agron M35 (higher values indicate lighter color): >60 acceptable; nu = non-uniform color. Waller Duncan LSD (K=100) for chip color = 3.

Maine Table 3.

Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for medium maturing varieties grown at Presque Isle, Maine - 1992.

Variety	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std.	% Stand (spacing) ²	Size Distribution by Class ¹ (%)						Size Distribution(%)		
					1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in. Gravity	
Medium Test- 108 days													
Kennebec (std)	402	325	100	89 (8)	2	12	24	53	9	0	98	62	1.081
Atlantic	378	335	103	89 (8)	3	22	37	34	4	0	97	38	1.093
Calchip	308	274	84	96 (10)	7	33	34	24	2	0	93	26	1.112
Gemchip	378	346	106	90 (10)	5	21	39	34	1	0	95	35	1.082
MaineChip	322	259	80	100 (10)	5	28	41	26	0	0	95	26	1.091
Snowden	350	319	98	100 (12)	7	31	37	24	1	0	93	25	1.099
Spartan Pearl	384	360	110	92 (8)	4	17	34	43	3	0	96	45	1.082
Yukon Gold	364	343	106	88 (8)	2	12	27	51	8	0	98	59	1.086
AF875-15	382	316	97	100 (10)	4	21	37	35	3	0	96	38	1.092
BO256-1	412	379	117	100 (10)	3	13	31	49	6	0	97	54	1.091
BO257-9	352	322	99	100 (10)	3	19	36	39	4	0	97	42	1.092
FL1533	351	300	92	100 (10)	2	17	27	47	7	0	98	54	1.085
FL1625	321	193	59	95 (10)	3	12	22	45	15	3	94	60	1.098
MN13540	358	320	98	99 (8)	9	56	30	4	0	0	91	4	1.084
NC012-18	393	349	107	97 (8)	7	31	39	22	1	0	93	23	1.092
NC012-19	359	308	95	92 (8)	2	14	34	44	5	0	98	49	1.096
NY87	386	357	110	90 (8)	5	29	47	18	1	0	95	19	1.080
Waller Duncan													
LSD (K=100)	34	35									9		0.004

¹Size classes for all varieties: 1=1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4".

²Inches between seedpieces noted within parentheses.

Maine Table 4.

Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for medium maturing varieties grown at Presque Isle, Maine - 1992.

Variety	Plant Data ¹			Tuber Data ¹		Tuber Defects (%)				Hollow Heart Rating ²	Chip Color ³	
	Size 7-22	Vine Matur. at 9-3	Vinekill	Shape	Appear-ance	Total	Sun- burn	Mis- shapen	Growth cracks			
Medium Test- 108 days												
Kennebec (std)	7	6	5	4	5	17.4	4.5	1.4	11.4	1	58	
Atlantic	8	5	5	2	6	8.3	2.3	1.9	4.1	3	65nu	
Calchip	6	7	7	3	3	4.2	0.4	3.8	0.0	2	54ds,dr	
Gemchip	5	7	7	4	5	3.4	1.5	0.6	1.3	0	63	
MaineChip	7	5	4	2	4	16.0	2.5	0.8	12.7	1	71	
Snowden	7	6	5	2	3	2.3	0.7	0.8	0.7	0	66	
Spartan Pearl	6	4	4	2	6	2.6	0.7	0.3	1.6	1	62ds	
Yukon Gold	6	3	2	4	6	3.6	1.7	0.9	1.0	0	43	
AF875-15	7	5	4	1	2	13.5	0.8	2.0	10.7	1	62	
BO256-1	7	6	5	1	5	5.6	0.1	1.1	4.3	0	54nu	
BO257-9	6	4	4	2	7	5.4	1.4	0.9	3.2	0	66	
FL1533	6	5	5	4	4	12.6	2.1	1.4	9.2	0	69	
FL1625	7	8	8	4	3	36.3	1.1	1.8	33.4	2	62dr	
MN13540	7	6	5	3	5	1.7	0.9	0.3	0.5	0	63dr	
NC012-18	8	4	4	3	5	4.3	2.4	1.5	0.3	1	63dr	
NC012-19	8	5	5	2	4	12.2	3.7	0.0	8.5	6	62	
NY87	7	4	3	2	5	3.1	2.5	0.0	0.6	0	66	

¹See standard NE107 rating system for key to codes.

²Unless otherwise noted, hollow heart rating equals number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agtron M35 (higher values indicate lighter color): >60 acceptable; dr = dark vascular ring; nu = non-uniform color; ds = dark stem end. Waller Duncan LSD (K=100) for chip color = 3.

Maine Table 5. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for late maturing varieties grown at Presque Isle, Maine - 1992.

Variety	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std.	% Stand (spacing) ²	Size Distribution by Class ¹ (%)						Size Distribution(%)		Specific Gravity
					1	2	3	4	5	6	1-7/8 to 4 in.	2-1/2 to 4 in.	
Late Test- 121 days													
Katahdin (std)	401	384	100	90 (8)	3	10	26	57	4	0	97	61	1.081
Allegany	477	467	122	92 (8)	1	12	36	48	3	0	99	51	1.086
Monona	365	349	91	95 (8)	3	22	42	32	1	0	97	33	1.076
Norwis	360	345	90	92 (8)	2	15	33	44	6	0	98	50	1.079
AF828-5	453	440	115	98 (8)	2	14	41	43	1	0	98	44	1.082
AF1060-2	483	466	121	96 (10)	2	9	24	53	12	0	98	65	1.085
BO175-20	408	394	103	100 (10)	1	9	26	58	5	1	98	63	1.103
BO178-34	358	344	90	97 (10)	2	9	29	55	5	0	98	60	1.098
MN12823	438	400	104	97 (8)	3	18	38	37	4	0	97	41	1.086
NYE11-45	404	379	99	89 (10)	4	23	37	35	1	0	96	36	1.082
NY84	494	470	122	94 (8)	3	16	36	44	1	0	97	46	1.078
Waller Duncan													
LSD (K=100)	42	41										9	0.004

¹Size classes for late varieties: 1=1-1/2 to 1-7/8"; 2=1-7/8 to 2-1/4"; 3=2-1/4 to 2-1/2"; 4=2-1/2 to 3-1/4"; 5=3-1/4 to 4"; 6=over 4".

²Inches between seedpieces noted within parentheses.

Maine Table 6.

Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color scores for late maturing varieties grown at Presque Isle, Maine - 1992.

Variety	Plant Data ¹		Tuber Data ¹		Tuber Defects (%)				Hollow Heart Rating ²	Chip Color ³	
	Size 7-22	Vine Matur. at 9-3	Vinekill	Shape	Appear-ance	Total	Defects				
							Sun- burn	Mis- shapen cracks			Growth cracks
Late Test- 121 days											
Katahdin (std)	7	7	6	2	7	1.6	0.5	1.1	0.0	0	45dr
Allegany	8	8	8	2	6	0.7	0.2	0.2	0.3	0	50nu
Monona	5	4	4	1	7	0.9	0.4	0.5	0.0	0	63
Norwis	6	5	4	2	4	1.7	0.0	1.7	0.0	4	63
AF828-5	7	7	7	4	6	1.3	0.1	0.8	0.3	0	35
AF1060-2	8	6	7	3	7	1.4	0.4	0.4	0.6	0	37
BO175-20	7	7	7	4	6	1.2	0.1	1.0	0.1	0	64
BO178-34	8	7	6	2	5	2.2	0.0	0.6	1.6	0	66
MN12823	9	6	5	4	7	6.0	0.1	5.9	0.0	0	60
NYE11-45	5	7	7	4	6	2.6	0.3	2.3	0.0	0	62
NY84	7	7	6	4	4	2.4	0.0	2.4	0.0	0	42nu

¹See standard NE107 rating system for key to codes.

²Unless otherwise noted, hollow heart rating equals number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agtron M35 (higher scores indicate lighter color): >60 acceptable; nu = non-uniform color; dr = dark vascular ring. Waller Duncan LSD (K=100) for chip color = 3.

Maine Table 7. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for russeted or processing varieties grown at Presque Isle, Maine - 1992.

Variety	Total Yield	Mkt. Yield	% of std.	% Stand (spacing) ²	Size Distribution by Class ¹ (%)					Size Distribution(%)		Specific Gravity
	cwt/A	cwt/A			1	2	3	4	5	over	over	
										8 oz.	12 oz.	
<u>Russet/Processing Test- 121 days</u>												
R. Burbank (std)	370	346	100	100 (16)	25	59	12	3	2	17	5	1.092
BelRus	276	268	77	99 (12)	24	66	9	0	0	10	0	1.097
Castile	395	375	108	100 (12)	16	67	11	2	4	17	6	1.091
Eide Russet	322	315	91	100 (14)	32	61	6	1	0	7	1	1.086
R. Norkotah	299	293	85	99 (12)	39	55	6	1	0	7	1	1.086
B9922-11	325	311	90	94 (12)	19	69	10	2	1	12	2	1.094
MN12567	370	357	103	99 (12)	48	44	7	0	1	8	1	1.083
NND671-4Rus	358	343	99	95 (14)	27	50	18	2	2	23	4	1.083
NND1538-1Rus	359	353	102	99 (12)	25	64	11	1	0	11	1	1.086
W1005Rus	363	350	101	100 (14)	27	56	14	3	0	18	4	1.102
Waller Duncan												
LSD (K=100)	29	32										0.004

¹Size classes for all varieties: 1=0 to 4 oz.; 2=4 to 8 oz.; 3=8 to 12 oz.; 4=12 to 16 oz.; 5=over 16 oz.

²Inches between seedpieces indicated within parentheses.

Maine Table 8. Plant size, maturity at vinekill, tuber shape, tuber defects, hollow heart ratings, and chip color indices for russeted or processing varieties grown at Presque Isle, Maine - 1992.

Variety	Plant Data ¹		Tuber Data ¹		Appear- ance	Tuber Defects (%)			Hollow Heart Rating ²	Chip Color Index ³	
	Size 7-22	Vine Matur. at 9-3	Matur. at Vinekill	Shape		Appear- ance	Tuber Defects (%)				
							Sun- burn	Mis- shapen			Growth cracks
Russeted/Processing Test- 121 days											
R. Burbank (std)	6	8	7	8	3	6.2	0.0	5.9	0.3	7	49dr
BelRus	4	7	6	8	4	3.1	0.5	1.8	0.8	0	53
Castile	6	7	6	7	7	5.1	2.6	2.5	0.0	0	50
Eide Russet	5	4	5	6	5	2.2	0.8	1.2	0.2	0	36
R. Norkotah	5	3	3	5	6	2.1	0.4	0.6	1.0	0	38
B9222-11	6	6	7	6	7	4.4	0.1	1.5	2.8	0	52
MN12567	6	5	5	3	3	3.6	1.8	0.6	1.2	2	53dr
ND671-4Rus	5	5	5	7	6	4.2	0.2	3.3	0.8	0	42
NND1538-1Rus	7	4	4	7	7	1.9	0.3	1.4	0.2	0	44dr
W1005Rus	7	9	7	8	7	3.4	0.7	2.7	0.0	1	59

¹See standard NE107 rating system for key to codes.

²Unless otherwise noted, hollow heart rating equals number of hollow tubers found per 40 large tubers cut and examined.

³Chip color -- Agtron M35 (higher values indicate lighter color): >60 acceptable (for chipping). dr = dark vascular ring. Waller Duncan LSD (K=100) for chip color = 4.

Maine Table 9.

French fry color and texture of selected potato clones and varieties under simulated processing conditions¹. All varieties were grown at Presque Isle, Maine, during 1991.

Variety	Color Grade ² Rating Index	Grayness ³ Index	Mealiness ⁴ Index	Comments ⁵	Overall Rating ⁶
Russet Burbank (std)	00	4.0	3.9	U	-
Frontier Russet	0	4.0	4.2	Be	-
Russet Norkotah	0	4.0	3.4	Be	-
B9922-11	0	4.0	4.7	U	0
ND671-4	0	4.0	3.8	Be	-
W1005 Rus	00	4.0	4.2	Be	-
Waller Duncan LSD (k=100)	0.5	NS	0.8		

¹Two center raw tuber slices were cut from each of ten tubers. The slices were rinsed in cool water, blanched for 8 minutes at 170°F, par-fried at 375°F for 80 seconds, and quick frozen at -30°C in plastic bags. Four such replications were processed and held at -15°F until evaluation. Prior to evaluation, samples were finish-fried at 360°F for 2-1/2 minutes, blotted dry with a paper towel, and cooled for 6 minutes. All samples were processed and evaluated by T. Work of the Department of Food Science, University of Maine, Orono, ME. Blanching and par-fry were conducted on November 25, 1991. Finish-fry and evaluations were conducted on December 6, 1991. All tuber samples were stored at 50°F, 85% R.H. from harvest until processing.

²Color Grades are from U.S.D.A. color standards chart #64-1, third edition.

³Grayness indices represent weighted means derived from the following evaluation scale: 4 = no graying; 3 = slight graying; 2 = moderate graying; 1 = intense graying.

⁴Mealiness indices represent weighted means derived from the following evaluation scale: 5 = dry, mealy; 4=mod. mealy, sl. moist; 3 = sl. mealy, mod. moist; 2 = soggy, not mealy; 1 = very soggy, not mealy.

⁵Comments: U = uniform fried color; Ir = french fries were irregular in color; dark blotches detracted from appearance of product; Be = Dark blotches on ends of many fries; Bc = Dark blotches in centers of many fries; Bl = general blotchy appearance of fries.

⁶Overall rating: quality rated better (+), not different (o), or poorer (-) than Russet Burbank.

Maine Table 10.

Chip color from 38°F, 45°F, and 50°F storage, reconditioning potential, after-cooking darkening indices, washed appearance ratings, days to sprout formation, and storage weight losses at 38°F and 50°F for 46 potato varieties grown at Presque Isle, Maine, during 1991 and stored during the 1991-1992 storage season.

Variety	Chip Color from Storage		After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indicated		Storage Wt.	
	50°F ¹	45°F ¹ 38°F ¹ Recond. ²			Sprout Length ⁵ PIP 1/2"	Loss % ⁶ 38°F 50°F		
Early Test:								
Superior	54	43	17	47	7.7	90 (5) SZ, M, LE, B	126	174
Chaleur	40	--	--	--	7.8	90 (7) SZ	126	181
Norchip	60	62	24	53	7.7	78 (3) PC, SS, LE, SZ, P	98	174
AF845-11	60	56	26	59	8.0	83 (2) PC, SS, BS, LE, B, AC	119	181
AF1302-1	54	27	18	32	7.8	60 (3) PC, BS, SZ	112	161
AF1333-1	52	27	17	27	7.8	80 (5) PC, BS, SZ	105	167
B0257-3	60	58	25	62	8.0	82 (3) SS, BS, LE, B, SZ	105	167
NYE55-44	65	68	25	55	8.0	89 (4) SS, BS, LE, B, SZ	119	174
Waller Duncan LSD	3	6	3	3				
Red Test:								
Chieftain	--	--	--	--	8.0	84 (7) B, SZ	117	172
Norland	--	--	--	--	7.5	77 (4) PC, SS, BS, SZ	110	158
Red Gold	--	--	--	--	7.9	70 (2) PC, SS, BS, B, SZ	68	124
Reddale	--	--	--	--	7.6	74 (5) PC, SS, LE, B	110	165
ND2224-5R	--	--	--	--	7.3	63 (5) SZ	110	165
Medium Test:								
Kennebec	64	41	19	50	7.7	96 (6) PC, LE, B	123	171
Atlantic	60	38	18	57	7.7	83 (8) B, SZ	88	137
Gemchip	65	39	16	58	7.7	87 (4) PC, LE, B, SZ	67	130
LaBelle	59	40	19	47	8.0	89 (5) PC, SS, LE, SZ, SK	95	137
MaineChip	67	62	29	63	7.7	85 (3) PC, SB, SS, LE, SZ	88	144
AC Novachip	63	53	21	62	7.8	92 (4) PC, SS, LE	95	137
Saginaw Gold	63	60	21	42	8.0	80 (3) PC, B, SZ, P	116	157
AF875-15	61	56	28	51	7.6	89 (2) PC, SB, SS, B, SZ	81	123
B0256-1	46	36	18	50	7.7	92 (5) SS, LE, B, SZ	67	88
B0257-9	63	58	30	48	7.6	94 (4) PC, M, SB, LE, B, SZ	88	130
F82026	57	--	--	--	7.6	86 (5) SB, SS, LE	109	164
NYE11-45	66	60	24	63	8.0	88 (6) LE, B	95	150
NYE55-27	63	46	20	58	7.6	88 (7) SZ	95	144
NYE57-13	68	61	24	62	7.1	83 (6) LE, B, SZ	137	185
NY85	66	59	17	60	8.0	90 (5) PC, LE, B, SZ	95	150
Waller Duncan LSD	2	6	3	3				

Variety	Chip Color from Storage		After-Cooking Darkening ³	Washed Appearance Index ⁴	Days to Indicated		Storage Wt.			
	50°F ¹	45°F ¹			Scout Length ⁵	Loss % ⁶				
	38°F ¹	PIP			1/2"	38°F	50°F			
Late Trial:										
Katahdin	50	30	15	56	7.8	91 (3) PC,SS,LE,B,SZ	80	143	10.3	22.5S
Allegany	60	37	18	50	8.1	86 (8) SS,B	122	177	8.9	9.4
AF828-5	45	--	--	--	8.3	84 (5) SS,B,SZ	101	149	10.9	18.1
AF1060-2	49	--	--	--	7.6	80 (3) PC,SS	94	136	9.3	16.5
AK-3-79-209-81	32	--	--	--	7.8	99 (7) SS,B	122	170	8.6	10.8
AK-3-79-235-81	42	--	--	--	7.1	72 (6) M,SS,B	101	149	8.0	14.9
B0175-20	62	42	27	61	7.6	88 (2) PC,SS,BS,LE	80	156	12.0	17.4
B0175-21	64	31	24	58	7.8	75 (5) LE,B,SZ	101	163	13.2	14.2
B0178-34	65	46	34	62	7.7	57 (2) PC,SS,BS,B	94	136	8.0	23.8S
NYE55-35	72	38	22	63	7.5	83 (8) B,SZ	94	149	6.8	13.0
NY78	61	--	--	--	7.8	88 (7) SB,SZ	80	129	8.6	20.6S
NY84	53	--	--	--	7.6	92 (6) LE,B,SZ	66	129	9.7	14.4
Waller Duncan LSD	3	7	4	2						
Russet/Processing Trial:										
Russet Burbank	50	39	19	50	7.5	44 (2) M,NR,GC	130	193	3.8	6.9
Frontier Russet	50	31	18	44	7.7	90 (6) SS	95	157	5.4	10.7
Russet Norkotah	49	32	17	48	7.5	86 (7) SS,SZ	95	157	6.6	12.2
B9922-11	55	33	17	53	7.9	89 (8) B	109	164	3.0	8.4
ND671-4	55	46	30	48	7.7	64 (5) SZ	95	164	7.0	10.2
W1005 Rus	60	48	27	51	7.8	88 (5) B,SZ	95	150	5.7	15.5
Waller Duncan LSD	5	7	3	6						

¹Stored at 38°F, 45°F or 50°F, 85% R.H. from harvest until February 4 to 18, 1992. Chip color scores are from an Agtron Model M-35 Process Analyzer (Agtron, Inc., Sparks, Nevada; calibrated with black disk "0" = 0 and white disk "90" = 90). Chips were crushed and reported values are means from four replicate samples. Each sample was read three times and was thoroughly mixed between readings. Higher numbers indicate lighter chip colors.

²Reconditioned samples were taken from 38°F and placed at 70°F for a 3-week period starting on January 14, 1992. See Agtron description under footnote #1.

³Samples were stored at 45°F, 85% R.H. from harvest until April 29, 1992 and were then warmed to 65°F for 96 h. Diced tubers were blanched for 5 min., cooled to 120°F, then rated after 30 min. with a Munsell Neutral Color Scale. Higher indices indicate lighter color.

⁴Unreplicated samples weighing approximately 7500 grams were stored at 45°F and 85% R.H. until January 30, 1992. Tubers were then washed and graded. First number indicates % U.S.#1 grade tubers in sample. Numbers in parentheses indicate subjective appearance of the sample using standard NE-107 appearance code. Codes indicate major external defects as follows: M=misshapen, NR=nonuniform russetting, PC=poor color, SB=black scurf, GC=growth cracks, CS=common scab, SS=silver scurf, RS=russet scab, DR=dry rot, SR=soft rot, BS=black scurf, LE=enlarged lenticles, B=bruises, BH=buttonhole, PS=pitted scab, SZ=small tuber size, ST=stolons adhere to tubers, SC=skin cracks, PE=pink eye, SK=skinning, AC=air cracks, and P=pear-shaped.

⁵Tubers were stored at 45°F, 85% R.H.

⁶Percentage sprout and weight loss following storage from harvest until March 2, 1992, at indicated temperature and 85% R.H. Numbers followed by "s" indicate heavily sprouted samples.

Maine Table 11. Standard NE107 rating codes for plant and tuber characteristics.

Rating Code	Plant Characteristics			
	Plant Size	Air Pollution	Vine Maturity	Plant Appearance Maturity at Vinekill
1	Very Small	Dead	Very Early	Very Poor
2	+	--	Early	Poor
3	Small	Mod. Defol.	+	+
4	+	--	Medium Early	--
5	Medium	Mod. Injury	Medium	Fair
6	+	--	Medium Late	+
7	Large	Mild Injury	+	--
8	+	--	Late	Good
9	Very Large	No Symptoms	Very Late	Excellent
				Completely Dead
				--
				Yel. and Dying
				--
				Mod. Mature
				--
				Initial Mat.
				--
				Not Maturing

Rating Code	Tuber Characteristics			Overall Appearance
	Skin Color	Skin Texture	Tuber Shape	
1	Purple	Part. Russet	Round	Very Deep
2	Red	Heavy Russet	Mostly Round	--
3	Pink	Mod. Russet	Round to Oblong	Deep
4	Dark Brown	Light Russet	Mostly Oblong	--
5	Brown	Netted	Oblong	Intermediate
6	Tan	Slight Net	Oblong to Long	--
7	Buff	Mod. Smooth	Mostly Long	Shallow
8	White	Smooth	Long	--
9	Cream	Very Smooth	Cylindrical	Very Shallow
				Excellent

1992 Potato Variety Evaluations: Michigan

The objectives of the evaluation and the management studies are to identify superior varieties for fresh market or for processing and to develop recommendations for the growers of those varieties. The varieties were compared in groups according to the tuber type and skin color and to the advancement in selection. The most promising seedlings are tested in management profile studies for their reaction to the spacing and nitrogen fertilization. Total and marketable yields, specific gravity, tuber appearance, incidence of external and internal defects, chip color, consistency and after cooking darkening as well as susceptibilities to common scab and blackspot bruising were determined. Before testing for chip color, the varieties were stored at 45 and 50°F.

The field experiments were conducted at the Montcalm Research Farm in Enniscorthy. They were planted in randomized complete block design, in four replications. The plots were 23 feet long and spacing between plants was 12 inches. Inter-row spacing was 34 inches.

Both round and long variety groups were harvested at two dates. The yield was graded into four size classes, incidence of external and internal defects was recorded, and samples for specific gravity, chipping, bruising and cooking tests were taken. Chip quality was assessed on 20-tuber samples, taking two slices from each tuber. Chips were fried at 365°F. The color was measured with an M-35 Agron colorimeter and visually with the SFA 1-5 color chart. Prior to chipping, the tubers were stored at 45 or 50°F.

Results

Round White Varieties

Thirteen varieties and nine breeding lines were compared at two harvest dates. Atlantic, Snowden, Onaway, and Superior were used as checks. The average yield was much below the two recent years. The results are presented in Tables 1 and 2.

Variety characteristics

Onaway—medium-early fresh market variety with excellent yield potential and a low specific gravity. Tubers are round to oblong, large, deep eyes, susceptible to growth cracks and early blight. It has very good internal quality, but the storability is poor.

Atlantic—medium-late, chipping variety of high specific gravity and good yield potential. Susceptible to scab, soft rot, white knot, and to internal defects (hollow heart, vascular discoloration, internal brown spot).

Superior—medium-early, fresh market variety. Tubers are well-shaped, medium size with a medium specific gravity. Resistant to scab but very susceptible to *Verticillium* wilt.

Gemchip—late, high yielding, fresh market and chipping variety. Tubers are large, round to oval and of good appearance. Specific gravity is low and has some tendency towards hollow heart.

Mainechip—medium-late variety of excellent chipping quality. It is comparable to Atlantic in specific gravity, lower yield potential, but better internal quality. Tubers are rather small.

Norwis—medium-late, high yielding variety. Tubers are large but in 1992 some hollow heart and quite frequent brown centers were present. The specific gravity is low and it is susceptible to scab.

Snowden—late maturing variety of excellent chipping quality. Specific gravity high. Tubers are round, small to medium size, well shaped with excellent internal quality. It is not resistant to scab, but has some resistance to *Fusarium* dry rot.

Castile—very late variety of very high yield potential. Tubers are well-shaped oblong and, very large, yet do not hollow. Tubers have a white skin and attractive appearance. Specific gravity is medium, and internal defects are few. Susceptibility to blackspot and some incidence of *Alternaria solani* was noted on tubers during storage.

Chipeta—very late variety of high yield potential. Chip color was good, but specific gravity a little too low.

Prestile—new tablestock variety from Maine and tested for the first time in Michigan. In 1992, it showed very high yield potential, tubers were round and very attractive. Textural quality was good, but scab infection was heavy. Reported to be susceptible to heat necrosis and air checks.

Portage—previously tested as CS7697-24. Early to

medium early fresh market variety. Yield potential is good. Tubers were round, well shaped, with low specific gravity. It was severely infected with scab.

Niska—medium-early, fresh market variety. It has medium to high yield potential. Specific gravity is too low for chipping. Vascular discoloration was common in oversize tubers.

Chaleur—medium-early, fresh market variety from New Brunswick, Canada tested for the first time. Yield and specific gravity were very low in 1992. Round, well shaped tubers and very good flesh color were observed.

NY78—late season tablestock variety which sets tubers early. Has excellent yield potential with large tubers. Vascular discoloration was quite frequent. Resistant to GN, early blight and scab.

E55-35—late maturity, medium yielding with high specific gravity and good chip quality. Tubers well-shaped, medium large and uniform in size. Few internal defects were noted and reported to have scab tolerance. Has a good potential in Michigan. The performance in 1992 was average.

E55-44—medium-early variety. Chipping quality is good but specific gravity is below 1.080. Tubers are medium large, uniform, well-shaped and of excellent general appearance. Good potential in Michigan. The performance in 1992 was poor.

AF1060-2—first year tested in Michigan. Maturity is medium-late with high yield and the tubers were round and well shaped. A selection from Maine with fresh market potential.

NY85—medium-early variety. The performance in 1992 much below average.

NY88—medium-early variety. The performance in 1992 much below average. Chip color very good, but specific gravity rather low. Selection is being dropped by Cornell.

W870—medium-late, chipping variety. Medium to high yield potential and high specific gravity. Tubers are medium-large and slightly flat. Few internal defects. The performance in 1992 was well below average. It is susceptible to scab.

W877—medium late variety of excellent chipping quality and high specific gravity. Average yield potential. It has good internal quality but is susceptible to scab.

W887—very late, high yielding and high specific gravity chipping variety. Tubers are large, slightly flattened with medium-deep eyes. Tendency to shatter, bruise and short dormancy were noted. Susceptible to scab but has some resistance to *Fusarium* dry rot.

Long Varieties

Five varieties and three breeding lines were tested. **A78242-5** was comparable to Russet Burbank in total yield, but significantly higher in the US No. 1 yield. **W1005** performed much below average. **W1005** and **Goldrush (ND1538-1)** (also tested in North Central Region trial) are the only russet lines of some potential in Michigan. Incidence of hollow heart was generally high among long varieties. The results are present in Tables 3 and 4.

Variety characteristics

Ranger Russet (A7411-2)—late, medium yielding, high specific gravity variety. Tubers are large and have good appearance. Few internal defects and excellent potential for processing but susceptible to blackspot and scab.

Frontier Russet is a medium-late variety with average yields. Specific gravity medium. Tuber appearance and cooking quality are good. Shows some resistance to scab but some tendency to hollow heart. Tubers develop purplish cast when exposed to light.

Russet Burbank—used as a standard in the trial. Late maturity, average yields. Specific gravity good for processing and baking. Has a tendency to form off-shape and undersize tubers and is resistant to scab.

Goldrush—medium early, fresh market variety. It has good yield potential. Tubers are russet red, oblong to long, and well shaped. Low specific gravity, good internal quality was noted. Similar in maturity and specific gravity to Russet Norkotah but fewer internal defects.

Russet Norkotah—early to mid-season variety. Yield potential and specific gravity are rather low. Tubers are

oblong to long and well shaped with some resistant to scab. After cooking darkening was recorded in some years as well as susceptibility to *Verticillium* wilt.

A78242-5—medium-late, average to high yield potential, medium specific gravity. Tubers are well-shaped, blocky and attractive. Tendency for hollow heart and brown centers was recorded in 1991, but not in 1992.

W1005—late variety of high yield potential, although it performed poorly in 1992. Tubers are long and rather thin. Specific gravity high. Resistant to scab but susceptible to black spot in 1992.

W1099—medium early variety, tested first year in Michigan. It has a dark russet skin. Yield and specific gravity were low.

Adaptation

The Michigan adaptation trial serves as a screen for advanced breeding lines from various states. The best lines from this trial will enter the dates of harvest experiment the following year. Thirty-two lines were tested in 1992. Steuben, Snowden, Spartan Pearl and Superior were used as checks. The results are presented in Table 5.

Among the check varieties, the best yielder was Steuben, followed by Snowden and Spartan Pearl. The 1992 growing season was disastrous for Superior because of verticillium wilt. Also LA12-59 (named Fontenot in 1992) performed below its average in previous years. Six lines yielded better than Snowden: MN12823, NYE11-45, MSB083-1, NY84, 84-9-8, and MSB076-2. MN12823 was the top yielder however it has very large and rather irregular tubers and its specific gravity was low. Chipping quality was fair. NYE11-45 has round and smooth tubers with low specific gravity. It may have a potential as fresh market variety.

MSB083-1, NY84 and 84-9-8 will be tested for fresh market potential, while MSB076-2 might also be an outTM of ©field chipper. B0256-3, 83-11-5, MSB007-1 and B0257-12 yielded on the level of Snowden and should be further tested in Michigan. Since the 1992 growing season was so untypical, most of the lines will be tested again for adaptation in Michigan in 1993.

Disease Evaluation

As part of the postharvest evaluation, resistance to *Fusarium sambucinum* (fusarium dry rot) was assessed by inoculating whole tubers post harvest. The tubers were held at 68°F for three weeks and then scored for disease by measuring the diameter of the decayed tissue. No absolute resistance was detected in the 114 varieties and advanced lines that were screened (Table 6). Some lines did, however, exhibit a lesser degree of rot than others. These included W887, Snowden, 86SD19-10Y, MS401-2Y, 83-6-18, and Frontier Russet. We will be repeating this evaluation on the lines that showed the greatest promise to confirm these results of our initial study.

Following the fusarium dry rot testing, *Alternaria solani* and Erwinia soft rot were evaluated. The low levels of infection observed in these studies did not discriminate between resistant and susceptible clones. We will be conducting further tests to optimize environmental conditions that will promote infection levels that discriminate between clones.

Blackspot Susceptibility

An integral component of the variety evaluation program has been an assessment of blackspot susceptibility. Check samples (CK) were 25 tuber samples collected from the normal harvest process. Bruised (BR) samples were also collected at harvest and placed in a hexagon plywood drum and tumbled 10 times to provide a simulated bruise. Both samples were peeled in an abrasive peeler in November and individual tubers were assessed for the numbers of blackspot bruise on each potato. These results are shown in Table 6. The advanced seedlings and varieties showing the least effect from the simulated bruise damage were Chipeta, E55-35, NY88, Portage, Onaway, Prestile, E55-44, Superior, and Chaleur. The incidence of blackspot injury is related to environmental conditions at harvest time, however, cultivars do not have inherent characteristics which influences the degree of injury.

Upper Peninsula Variety Trial

A potato variety trial was conducted by Dr. Rich Leep on the Paul/Mike Van Damme Farm. The plots were planted on May 14 and harvested on September 25. Overall yields were very good. Table 7.

Table 1. Round whites on first date of harvest (August 6, 1992) at Montcalm Research Farm (92 days).

Variety	CWT/Acre		Percent of Total ¹				Spec.	Tuber Quality ²			3+ Year
	US#1	Total	B	A	OV	PO	Grav.	HH	VD	BCIBS #	US#1 Ave
Atlantic	304	330	7	86	6	2	1.084	12		17	320
Onaway	304	345	11	80	8	2	1.068	0		21	375
Prestile	298	331	9	83	8	1	1.067	1		7	--
Portage	293	344	12	79	7	3	1.067	0		19	--
AF1060-2	277	304	8	80	12	1	1.069	0		34	--
Norwis	273	324	13	82	3	3	1.062	6		7	330
E55-44	271	307	10	80	8	3	1.076	0		18	339
NY78	259	300	13	84	3	1	1.064	0		6	--
Castile	247	317	22	77	1	1	1.069	0		2	445*
NY88	232	303	22	75	2	2	1.075	0		4	--
E55-35	231	284	19	79	2	1	1.077	0		9	283*
Chaleur	228	261	12	83	4	1	1.068	0		7	--
W870	226	282	19	80	1	1	1.084	0		2	318*
Mainechip	226	278	17	80	1	3	1.084	0		1	283
Chipeta	218	258	13	84	0	3	1.071	0		0	--
W887	210	250	16	84	1	0	1.082	1		1	283
NY85	208	277	24	75	0	0	1.075	0		2	--
Niska	202	282	26	72	1	2	1.073	0		1	335*
W877	194	244	20	78	2	1	1.093	1		4	--
Gemchip	174	218	19	80	0	2	1.070	0		0	278
Snowden	167	259	36	64	0	0	1.082	0		0	265*
Superior	151	207	26	71	2	2	1.074	0		3	265
Average	236	287					1.074				
LSD(.05)	44	38									

Planted May 5, 1992

* Two year average

¹Size: A—2-3.25", B—2", OV—> 3.24", PO—Pick outs²Quality: HH—Hollow Heart, VD—Vascular Discoloration, BC—Brown Center, IBS—Internal Brown Spots, #—Number of oversize tubers cut

Table 2. Round whites on second date of harvest (September 10, 1992) at Montcalm Research Farm (127 days).

Variety	CWT/Acre		Percent of Total ¹				Spec. Grav.	Tuber Quality ²				3+ Year US#1 Ave	
	US#1	Total	B	A	OV	PO		HH	VD	BC	IBS #		
Prestile	454	476	3	75	21	1	1.082			2	40	--	
Atlantic	404	429	4	69	25	2	1.093	14		9	40	415	
NY78	400	432	7	80	12	1	1.073		20		35	--	
Chipeta	396	445	4	60	29	7	1.083	1	4		40	--	
Castile	372	423	9	83	5	3	1.084				16	507*	
Norwis	358	414	4	76	10	9	1.073	4		13	33	428	
Portage	356	411	7	74	12	6	1.073		9		34	--	
AF1060-2	356	400	7	61	28	5	1.075		6		40	--	
W887	332	361	5	79	13	3	1.095	2	1	2	1	37	409*
Snowden	320	394	17	80	2	1	1.089		1		6	342*	
Niska	288	358	14	76	4	5	1.080		6		10	--	
E55-35	281	314	8	82	8	2	1.089		1	3	20	400	
Onaway	277	320	10	81	6	4	1.068		1		14	428	
Gemchip	275	323	6	70	15	9	1.079	5	1		33	424	
W870	247	291	12	82	3	3	1.087				7	--	
NY88	235	292	18	77	3	1	1.082				8	--	
NY85	219	276	18	78	1	2	1.084				2	--	
Mainechip	206	246	13	79	5	4	1.089				11	312	
Chaleur	204	237	12	80	6	2	1.069			1	10	--	
E55-44	186	223	16	79	5	0	1.074	1			8	352	
W877	147	184	17	77	3	3	1.094				5	306	
Superior	88	138	35	64	0	1	1.072					290	
Average	291	336					1.081						
LSD(0.05)		60											

Planted May 5, 1992

* Two year average

¹Size: A—2-3.25", B—2", OV—>3.25", PO—Pick outs

²Quality: HH—Hollow Heart, VD—Vascular Discoloration, BC—Brown Center, IBS—Internal Brown Spots, #—Number of oversize tubers cut

Table 3. Long Russets on first date of harvest (August 6, 1992) at Montcalm Research Farm (92 days).

Variety	CWT/Acre		Percent of Total ¹				Spec. Grav.	Tuber Quality ²				3+ Year US#1 Ave
	US#1	Total	B	A	OV	PO		HH	VD	BC	IBS #	
A78242-5	160	271	42	58	0	1	1.073	0			3	258
R. Norkotah	135	238	42	51	3	4	1.070	0			0	249
R. Burbank	133	250	40	51	1	7	1.070	0			2	214
Ranger R.	122	228	45	50	2	4	1.073	0			0	243
Goldrush	118	243	50	45	3	3	1.067	0			11	--
Frontier R.	117	226	48	50	1	2	1.069	0			1	236
W1005	114	235	47	48	0	4	1.075	0			1	279
W1099	111	224	49	47	2	3	1.068	0			6	--
Average	126	240					1.071					
LSD(0.05)	77	67										

Table 4. Long Russets on second date of harvest (September 10, 1992) at Montcalm Research Farm (127 days).

Variety	CWT/Acre		Percent of Total ¹				Spec. Grav.	Tuber Quality ²				3+ Year US#1 Ave
	US#1	Total	B	A	OV	PO		HH	VD	BC	IBS #	
A78242-5	387	452	13	64	21	1	1.079				30	349
Ranger R.	313	399	13	52	27	9	1.086	1			40	357
R. Burbank	298	428	15	54	15	16	1.082				35	322
Goldrush	264	341	19	60	17	3	1.069				34	386
Frontier R.	247	315	20	60	18	1	1.078			1	35	316
W1099	210	297	25	65	5	4	1.068				13	--
W1005	167	261	34	62	2	2	1.081				15	376
R. Norkotah	153	225	30	62	6	2	1.069	1			12	273
Average	255	340					1.077					
LSD(0.05)	74	67										

Planted May 5, 1992

* Two year average

¹Size: A—2-3.25", B—2", OV—>3.25", PO—Pick outs²Quality: HH—Hollow Heart, VD—Vascular Discoloration, BC—Brown Center, IBS—Internal Brown Spots, #—Number of oversize tubers cut

Table 5. 1992 Adaptation at Montcalm Research Farm on September 14, 1992 (130 days).

Variety	Typ ¹	CWT/Acre		Percent of Total ¹				Spec.	Tuber Quality ²			
		US#1	Total	B	A	OV	PO	Grav.	HH	VD	BC	IBS #
MN12823	L	509	599	2	52	34	13	1.079	5		8	1 40
Steuben		488	510	3	56	40	2	1.082		2		40
E11-45		470	523	9	84	6	1	1.072		1	3	29
B083-1		460	525	8	66	22	5	1.080	1	11		3 40
NY84		418	470	10	74	14	2	1.071		2	1	2 31
P84-9-8		408	527	6	72	6	17	1.086	7	1	5	25
B076-2		402	434	7	84	9	1	1.095				29
Snowden		360	409	11	77	11	2	1.088		6		2 30
B2750		346	374	5	67	26	2	1.089				36
P83-11-05		343	515	10	67	2	21	1.086	2		1	8
S. Pearl		336	362	6	78	15	1	1.081	1			34
B007-1	L	327	375	9	72	15	5	1.070		1		31
B2753		323	380	8	71	15	8	1.080	1		3	34
R. Cloud	Rd	309	337	5	64	28	3	1.071				1 40
P83-6-18		306	398	18	74	3	5	1.075				10
MS401-2	Y	290	330	11	79	9	2	1.089			4	18
BO42-1	Ru	284	322	31	51	16	2	1.082			2	1 20
E57-13		268	316	14	76	9	2	1.069			1	23
AO91-1		263	310	13	76	8	3	1.083		3	1	17
LA12-59	Rd	259	281	5	62	30	3	1.081	2	2		40
A84180-8	Ru	254	305	12	60	23	6	1.071	8			2 35
MS402-7		247	266	5	77	16	2	1.075				33
NY91		236	274	11	67	19	3	1.087	4	1	6	23
B9922-11	Ru	225	276	16	66	16	2	1.078	2			4 26
BO052-1		208	257	19	78	2	1	1.076				5
B110-3		206	256	16	76	4	4	1.089			1	10
B2751		206	248	17	81	2	1	1.089				2 4
W178-R	Rd	197	278	30	67	2	1	1.062				3
B027-1R	Ru	193	250	20	70	7	4	1.071	4		2	14
P84-13-12		184	222	19	78	4	0	1.092				9
B095-2		153	213	28	71	1	0	1.086				1
B111-4Y	Y	151	194	26	61	11	2	1.066		3		16
A1161-1		142	182	21	74	3	2	1.069			1	1 6
MN13540	L	98	167	42	55	3	1	1.071				3
Superior		84	148	43	54	1	2	1.093		1		12
84-75R	Rd	82	199	58	40	0	2	1.064		3	2	9
B2752		75	100	25	73	2	1	1.065				1
B0899-1	Rd	70	111	40	57	0	4	1.063				0

Planted May 5, 1992

* Two year average

¹Type: Rd—Red, Ru—Russet, Y—Yellow, L—Long²Size: A—2-3.25", B—<2" or <4 oz, OV—>3.25" or >10 oz, PO—Pick outs³Quality: HH—Hollow Heart, VD—Vascular Discoloration, BC—Brown Center, IBS—Internal Brown Spots, #—Number of oversize tubers cut

Table 6. 1992 Bruise trial of round whites from dates of harvest.

Variety		Percent	Number of Tubers					
		Bruise Free	0	1	2	3	4	5 + Bruises per tuber
Castile	CK ¹	92	23	2				
	BR ²	16	4	4	9	5	1	2
Niska	CK	92	23	1	1			
	BR	40	10	8	5	2		
NY87	CK	88	22	3				
	BR	44	11	6	6	2		
Atlantic	CK	88	22	3				
	BR	48	12	6	4	2		1
Snowden	CK	88	22	3				
	BR	48	11	8	3		1	
NY85	CK	100	25					
	BR	48	12	7	6			
W877	CK	92	23	2				
	BR	52	13	9	2	1		
W887	CK	100	25					
	BR	63	15	5	4			
Mainechip	CK	96	24	1				
	BR	64	16	5	3	1		
AF1060-2	CK	100	25					
	BR	64	16	3	5	1		
W870	CK	96	24	1				
	BR	68	17	4	1	3		
Gemchip	CK	100	25					
	BR	68	17	4	1	3		
Norwis	CK	100	25					
	BR	68	17	6	1	1		
Chipeta	CK	88	22	3				
	BR	76	19	5	1			
E55-35	CK	100	25					
	BR	80	20	5				
NY88	CK	92	23	2				
	BR	84	21	3	1			
Portage	CK	96	24	1				
	BR	84	21	2	2			
Onaway	CK	100	25					
	BR	84	21	3	1			
Prestile	CK	92	23	2				
	BR	88	22	2	1			
E55-44	CK	96	24	1				
	BR	96	24	1				
Superior	CK	96	24	1				
	BR	100	22					
Chaleur	CK	100	25					
	BR	100	25					

¹CH—Check, no additional bruising²BR—Bruising was simulated at harvest

Table 7. Tuber yield, size distribution, and specific gravity of fourteen potato varieties in the Upper Peninsula of Michigan.

Variety	CWT/Acre		Percent of Total ¹					Spec. Grav.
	US#1	Total	US#1	B	A	OV	PO	
Castile	557	581	96	4	66	30	0	1.085
Prestile	530	553	96	4	67	29	0	1.081
Ranger Russet	487	553	88	11	68	20	1	1.092
NY78	459	489	94	6	70	24	0	1.076
A78242-5	453	481	94	6	69	25	0	1.082
Gemchip	422	472	90	9	79	10	2	1.086
W1005	397	487	81	19	75	6	0	1.091
E55-35	393	441	89	10	81	8	1	1.091
Frontier Russet	389	428	91	9	67	23	1	1.084
W1099	368	397	93	7	76	16	1	1.078
Norwis	366	397	92	8	75	17	0	1.075
Russet Burbank	353	462	75	7	63	12	18	1.089
Russet Norkotah	302	362	84	16	78	6	0	1.079
ND1538-1	277	324	85	13	76	9	2	1.078

Farm Cooperator: Mike VanDamme

Planted: May 14, 1992 (20 seed pieces—1 foot apart)

Harvested: September 25, 1992

¹Size: A—2-3.25", B—2", OV—> 3.25", PO—Pick outs

AUTHORS: R.W. Chase, D.S. Douches, K. Jastrzebski, R. Hammerschmidt, J. Smeenk and R. Leep
Departments of Crop and Soil Sciences, Food Science and Human Nutrition, and Botany and Plant Pathology
Michigan State University
East Lansing, MI 48824

Introduction

In 1992, two red, three russet and two white/chip trials were conducted. Nebraska also participated in the North Central Regional (NCR) trials. The red trials were conducted south of Bridgeport and west of Alliance; the russet trials were also conducted at these locations plus a third trial east of Alliance. The white/chip trials were conducted east and west of Alliance. The NCR trial was conducted west of Alliance.

Materials, Methods and Conditions

All trials were conducted on farm sites under center-pivot irrigation; 9 to 15 inches were added in addition to above normal rainfall of 5 to 8 in during the season. Fertilization ranges were 122 to 192 lb N/ac, 68 to 100 lb P/ac, 0 to 22 lb K/ac and 20 lb S/ac; Low levels of Mg, Mn and Zn were added in some trials. Seed pieces were cut, treated with TOPS2.5D and stored for three to seven days at 55 F. Growers used their conventional practices. Insecticides were Thimet applied at planting and post-emergence applications of various products -- Ambush, DiSyston, Parathion, Pounce, or Thiodan. Turbo applied pre-emergence was the standard herbicide; Eptam was applied post-emergence at one location. Besides the seed treatment, Bravo was used for early blight and, at one site, Kocide was used. Vines were desiccated with Diquat and/or mechanical beating.

The trial design in the red, russet and white/chip trials was 100 foot strip plots from which three 12-foot samples were taken; the NCR trial design was that of the accepted protocol -- four replicates of 25 plants in a randomized-complete-block (Johansen et al. 1991). The key, growth dates for all trials are listed in Table 1.

There was above average rainfall and below normal temperatures for the 1992 season. Skies were cloudier than normal, but the wind was normal for western Nebraska. Hail was severe in early part of the season, mid to late June, and moderate in late July.

Field observations were taken first week of August. Yield data were taken on tubers under 1 7/8 in, between 1 7/8 and 3 1/2 in, and over 3 1/2 in sizes. Within a week after harvest, tuber defects and specific gravities on 1 7/8

to 3 1/2-inch tubers were determined visually and using a hydrometer, respectively. Chip and fry color were measured using an Agtron FF10. Color was determined after curing for one month at 55-60 F. After the curing period, half of the chipping samples were stored for 2 1/2 months at 50 F and the other half at 40 F. After a second curing period of two weeks at 60 F, a second chip color reading was taken. Data for the NCR trial were taken according to its protocol (Johansen et al. 1991).

Table 1. Key dates for each trial in 1991.

	Bridge- port	West Alliance	East Alliance	NCR Trial
P	4/24	5/23	5/ 9	5/26
E	5/22	6/13	6/ 1	6/15
D	8/28	9/11	9/18	9/11
H	9/ 1	9/23	9/23	9/23
days:				
P - H	130	123	137	120
E - D	98	90	109	88

P = planting, E = emergence,
D = vine desiccation, H = harvest.

Results

Red trials

The yield at Alliance was higher than that at Bridgeport (Table 2). Red LaSoda had the highest yield, medium specific gravity and a high percentage of US#1 tubers. At Alliance where scab was a factor, this variety had the highest number (68%) of tubers with scab and the severity was the greatest, deep pitted. Dark Red Norland and ND1871-3R also performed well at Alliance. In both trials, LA12-59 had the highest specific gravity. There were few if any off-types, vascular discoloration, hollow heart, or tuber rots in these trials. A few black scurf colonies were observed on tubers. There was no early blight in Alliance on 8/3. At Bridgeport, most of the Dark Red Norland vines and half of the LA12-59 vines had early blight. Tuber sets were lowest on Red LaSoda, 6 to 7 (Table 6).

Russet trials

Yields were highest at east Alliance (Table 3). Specific gravity and percent US#1 tubers were the lowest, and there was the least black scurf at Bridgeport. The best performing russet variety at all three locations was Goldrush (ND1538-1Rus). In all trials, it had the highest yield, the highest percent US#1 tubers, average specific gravity, and a good fry color after a one-month curing period. ND671-4Rus had low yields of US#1 tubers, 40, 146 and 296 cwt/ac at Bridgeport, east Alliance and west Alliance, respectively; it also had black scurf on the tubers from both Alliance locations. The best fry color was observed with A7961-1, and the highest specific gravity was obtained with this variety and Ranger Russet. There were few tubers graded as off-types (less than 10%), vascular discoloration, hollow heart or tuber rots. Foliar early blight was only observed around 8/1 at Bridgeport. There half of the Norgold R. and a quarter of the ND671-4Rus plants were infected at that time. Tuber set tended to be lower at east Alliance than at the other two locations (Table 6).

White/chip trials

The means of yields, percent US#1 tubers, specific gravity, and chip color for the two locations were nearly the same (Table 4). The highest yielding varieties in both trials were Chipeta (AC80545-1) and AC83306-1; the lowest yielding varieties were MS401-1y and W870. NY85 and Monona had low yields at west and east Alliance, respectively. Snowden and NYE55-35 had among the highest specific gravities in both trials; A80559-2, MN12823 and MS700-70 had among the highest in one of the two trials. Low specific gravities were recorded in one or both trials for NYE57-13, MN12567, NE84106, A80559-2, and Monona. Chip color after pre-storage curing was highest (>69) for A80559-2, NY85, AC85506-1, MN12823, Chipeta, and Monona in at least one of the trials. MN12567 had low chip color in both trials. After storage for 3 months at 50 F, only MN 12567's chip color dropped to 50. Chipeta maintained the best color in both trials. After cold-storage for 3 months at 40 F, Monona, Norchip, MN12567, MS401-1y, and NY 85 showed a sever drop in chip color in both trials. Snowden maintained the best chip color, 64 and 70 in both trials, respectively, after the colder storage. Overall the best chip colors consistently came from Chipeta and Snowden.

At both locations (west and east Alliance), Norchip had the highest percentage of off-types (Table 5). MN12567 had black scurf; MN12823 had common scab, and NY85 had both diseases at both locations. There was more

common scab at west than east Alliance. Atlantic had a high percentage of tubers with common scab and black scurf on the tubers at west Alliance but was not included in east Alliance trial. Chipeta had black scurf at both locations and, at west Alliance, 46% of the tubers had tuber blight and 18% had vascular discoloration (Table 5). The rot noted for other varieties was principally dry rot. There was no early blight at either location near Alliance on 8/3. Tuber set was taken at east Alliance only and ranged from 4 to 22 per plant, based on two plants (Table 6).

North Central Regional Trial

In 1992, eight selection numbers and five check varieties were submitted. In Nebraska, the trial was conducted west of Alliance. The highest total yields were obtained from Red Pontiac and MN12823, and the highest yields of US# 1 tubers were from Norland and MN12823 (Table 7). W 870 had the highest total solids as determined by specific gravity using a hydrometer and the highest chip color as measured by an Agron FF10. Common scab on tubers was relatively high for ND2224-5R, MN12823, W870, W1100R, and Red Pontiac (Table 8). Red Pontiac, ND2224-5R and MN12823 had the greatest number of tubers with common scab, over 15%. This resulted in the lowest percentages of tubers without external defects for these entries. ND12823 also had the highest amount of off-type tubers, and ND1871-3R had the most tuber blight. All entries had less than 10% internal defects (Table 8). Norgold R. M had hollow heart in 6% of the tubers, all of which were large tubers. The general merit ratings, in descending order, were Norland (red check), Norgold R. M (russet check), Norchip (white/chip check), LA 12-59 (red), and W 870 (white/chip). Refer to the summary on the NCR Trials by Johansen et al. earlier in this volume.

Discussion

As in the 1991 red trials, Red La Soda was the highest yielding variety (Pavlista 1991). LA12-59 had a consistently high specific gravity as in previous years. Goldrush (ND1538-1Rus) consistently performed better than average in previous years (Pavlista et al. 1992), but, this year, it was the best performing russet in the trials. In previous NCR trials, Goldrush has consistently received a good general merit rating (Johansen et al. 1991). In 1992, Chipeta (AC80545-1) has performed much better than in the 1989 and 1990 Nebraska trials (Pavlista et al. 1992). It had the highest yield, good specific gravity and a light chip color. However, it tended to have tuber blight, vascular discoloration and black scurf colonies. It also tended to skin easily and be

sun-green. Snowden (W855), although not a high yielding variety had, with Chipeta, the best, overall chip color performance in storage and it had a high specific gravity. This was consistent with past performance (Pavlista 1991, Pavlista et al. 1992). Among the new selections, those that looked promising include A80559-2, AC83306-1, MS700-70, and NYE55-35. In the NCR trial, LA12-59 and W870 were rated in the top five as last year (Johansen et al. 1991, Pavlista 1991).

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Table 2. Yield and tuber quality on red-skinned, potato varieties, 1992.

Entries	Yield, total cwt/ac	US# 1 % total	Specific gravity	C. scab % tubers	Bl. scurf % tubers
Bridgeport --					
D.R. Norland	210	81	1.065	0	0
R. LaSoda	332	95	1.070	0	1
LA 12-59	268	91	1.075	0	0
MN 13035	223	94	1.070	0	0
ND 1871-3R	250	84	1.070	0	0
location means	257	91	1.070	0	0
west Alliance --					
D.R. Norland	339	96	1.070	0	2
R. LaSoda	339	97	1.070	68	8
LA 12-59	290	92	1.084	4	8
MN 13035	198	97	1.069	2	4
ND 1871-3R	354	97	1.076	8	6
location means	304	96	1.074	16	6

Table 3. Yield and tuber quality on russet-skinned, potato varieties, 1992.

Entries	Yield, total cwt/ac	US# 1 % total	Specific gravity	C. scab % tubers	Bl. scurf % tubers	Fry color Agtron FF10
Bridgeport --						
R. Burbank	217	87	1.077	0	8	56
Goldrush	409	94	1.074	2	0	52
Norgold R.	226	86	1.076	0	1	52
Ranger R.	293	95	1.068	0	8	50
A 7961-1	339	95	1.085	0	1	62
CO 8011-5	323	89	1.078	0	0	54
ND 671-4Rus	345	12	1.070	0	6	57
location means	307	80	1.075	0	3	55
west Alliance --						
R. Burbank	317	96	1.081	0	22	56
Goldrush	375	98	1.079	0	12	47
Norgold R.	293	94	1.075	0	10	30
Ranger R.	339	90	1.092	14	6	45
A 7961-1	275	97	1.089	0	0	49
CO 8011-5	217	84	1.073	0	16	45
ND 671-4Rus	323	92	1.071	0	30	53
location means	306	93	1.080	2	14	46
east Alliance --						
R. Burbank	---	--	---	-	--	----
Goldrush	427	96	1.075	0	10	62
Norgold R.	387	92	1.075	0	6	35
Ranger R.	326	96	1.094	0	14	62
A 7961-1	366	95	1.093	4	32	66
CO 8011-5	393	92	1.072	0	0	58
ND 671-4Rus	171	85	1.075	0	16	46
location means	345	93	1.081	1	13	55

Table 4. Yield and processing quality of white-skinned, potato varieties, 1992.

Entries	Yield, total cwt/ac	US# 1 % total	Specific gravity	Chip color, Agtron FF10		
				1 mon @ 60F	3 mon @ 50F	3 mon @ 40F
west Alliance --						
Atlantic	375	90	1.095	68	63	61
Chipeta	413	83	1.092	63	67	60
Monona	323	62	1.084	59	61	53
Norchip	287	87	1.090	58	57	49
Snowden	293	89	1.097	63	63	64
A 80559-2	375	94	1.100	73	63	59
AC 83306-1	401	94	1.093	67	66	54
MN 12567	342	96	1.077	51	50	39
MN 12823	393	76	1.092	52	60	41
MS 401-1y	90	61	1.089	64	59	50
MS 700-70	332	92	1.102	63	59	60
NE 84106	317	96	1.081	66	53	46
NY 85	238	96	1.092	71	65	34
NYE 55-35	332	96	1.098	68	65	67
NYE 57-13	268	94	1.078	62	69	64
W 870	247	99	1.095	61	61	55
location means	314	88	1.091	63	61	54
east Alliance --						
Atlantic	---	--	----	--	--	--
Chipeta	528	84	1.093	70	68	57
Monona	207	84	1.069	70	60	49
Norchip	284	89	1.092	64	61	48
Snowden	284	95	1.098	66	60	70
A 80559-2	323	94	1.078	63	69	55
AC 83306-1	589	78	1.094	70	65	70
MN 12567	366	97	1.080	59	59	49
MN 12823	366	87	1.099	73	68	65
MS 401-1y	149	98	1.085	64	61	53
MS 700-70	---	--	----	--	--	--
NE 84106	317	96	1.085	60	63	58
NY 85	302	97	1.089	68	67	36
NYE 55-35	299	88	1.099	68	63	52
NYE 57-13	348	95	1.078	68	64	58
W 870	262	98	1.094	67	58	61
location means	330	91	1.088	66	63	56

Table 5. Tuber diseases on white-skinned, potato varieties, 1992.

Entries	Tuber defects, percent of 100-tuber samples					
	Off-types	C. scab	Bl. scurf	Rot	Vascul. discol.	Hollow heart
west Alliance --						
Atlantic	0	70	94	0	0	8
Chipeta	2	8	14	46*	18	0
Monona	0	22	2	2	4	0
Norchip	18	6	0	0	4	6
Snowden	0	78	0	0	0	0
A 80559-2	0	42	2	2	0	0
AC 83306-1	0	42	14	18*	0	0
MN 12567	2	4	14	0	1	0
MN 12823	6	44	8	2	0	6
MS 401-1y	2	38	0	0	--	--
MS 700-70	0	42	2	0	0	0
NE 84106	0	30	0	0	0	0
NY 85	2	84	44	0	0	0
NYE 55-35	0	24	0	0	2	0
NYE 57-13	0	20	32	0	4	0
W 870	6	32	20	0	6	0
location means	2	34	15	4	3	1
east Alliance --						
Atlantic	--	--	--	--	--	--
Chipeta	4	4	38	0	0	0
Monona	0	4	12	4	4	4
Norchip	20	0	0	0	0	4
Snowden	0	8	6	0	0	0
A 80559-2	4	2	6	0	0	6
AC 83306-1	4	8	4	2	2	0
MN 12567	2	4	32	0	0	0
MN 12823	6	38	2	2	0	2
MS 401-1y	2	0	2	8*	0	12
MS 700-70	--	--	--	--	--	--
NE 84106	0	8	10	0	--	--
NY 85	2	12	78	6	2	2
NYE 55-35	0	0	0	0	0	0
NYE 57-13	0	0	0	0	0	0
W 870	2	0	10	2	0	0
location means	3	6	14	2	1	2

* These percentages of tuber rots denote tuber blight; all others denote dry rot.

Table 6. General observations on potato varieties, 1992.

Entries	Vine size	Tuber set	Comments
Red entries --			
D.R. Norland	small-med.	6-12	early blight (BP)
R. LaSoda	medium	6- 7	pale red skin color; blotches and stripes on tubers
LA 12-59	med.-large	12-16	skin bruised easily; early blight (BP)
MN 13035	medium	11-13	a few sprouted tubers; tuber blight
ND 1871-3R	large	11-13	
Russet entries --			
R. Burbank	very large	9-10	unusually good tuber shape for NE Panhandle
Goldrush	med.-large	8-11	
Norgold R.	small-med.	5-15	early blight (BP)
Ranger R.	large-v.large	5-14	good skin set; large US#1 tubers; some tuber blight
A 7961-1	very large	3-12	nice shape; large US#1 tubers; some tuber blight
CO 8011-5	variable	7-12	skinny tubers; large US#1 tubers
ND 671-4RUS	small-med.	7-17	small, nicely-shaped tubers; enlarged lenticels
White/chip entries --			
Atlantic	medium	8	large US#1 tubers
Chipeta	very large	7	skins easily; tuber blight; green tubers (40%); oversizing
Monona	small	5	oversize tubers
Norchip	medium	13	tuber blight; green tubers (30%); cracks growth
Snowden	large	6	(A few tubers had a pink hue in skin areas.)
A 80559-2	large-v.large	7	knobby tubers
AC 83306-1	very large	8	large, round tubers; tuber blight; skins easily
MN 12567	large	5	
MN 12823	large	7	skins easily; green tubers (30%); oversize tubers
MS 401-1y	small-med.	7	skins easily; tuber blight; yellow flesh and 10% white
MS 700-70	med.-large	4	
NE 84106	medium	10	
NY 85	small-med.	9	small US#1 tubers
NYE 55-35	med.-large	9	small, very round US#1 tubers
NYE 57-13	medium	22	small, very round US#1 tubers
W 870	medium	6	

Table 7. Summary of yield and process quality of selection numbers and varieties in the NCR Trials, 1992.

selection number or entry	Skin-type	Yield, total cwt/ac	US# 1 % total	Total solids, %	Chip color Agron FF10
Norland	red	399	94	16.5	47
Red Pontiac	"	447	79	17.7	40
LA 12-59	"	319	93	19.1	59
ND 1871-3R	"	372	95	18.8	48
ND 2224-5R	"	310	94	17.1	57
W 1100R	"	344	89	17.1	54
Norgold R. M	russet	409	85	18.0	29
R. Burbank	"	315	96	19.9	48
Norchip	white	336	94	20.1	62
MN 12823	"	469	84	20.3	61
MN 14489	"	251	86	18.4	51
W 870	"	253	94	21.6	69
W 887	"	---	--	----	--
means		352	90	18.8	52

Table 8. Summary of tuber defects and comments on selection numbers and varieties in the NCR Trials, 1992.

selection number or entry	Most typical common scab area/type (1)	% tubers with scab (2)(3)	% without external defects (2)(4)	% without internal defects (2)(5)	comments
Norland	T/1	2	89	100	
Red Pontiac	T/1-3	86	11	96	black scurf and common scab
LA 12-59	T/1	4	92	100	
ND 1871-3R	T/1	11	78	98	scab and tuber blight
ND 2224-5R	1/5	71	29	99	scab
W 1100R	T/1-4	15	85	100	small US# 1 tubers, scab
Norgold R. M	T/1	1	85	93	
R. Burbank	0	0	96	98	
Norchip	T/1	4	86	98	small US# 1 tubers, black scurf
MN 12823	T/4	30	59	98	highly variable tuber shapes
MN 14489	T/1	5	83	98	lots of black scurf colonies
W 870	T/4	14	82	100	lots of black scurf colonies
W 887	-----	--	--	---	
means	T/1	20	73	98	

(1) Area/type = area: T = less than 1%; 1 = 10-20%, 2 = 21-40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%;
type: 1 = small, superficial; 2 = larger, superficial; 3 = larger, rough postules; 4 = larger postules,
shallow holes; 5 = very large postules, deep holes.

(2) Percentage of tubers in a 100-tuber pooled sample.

(3) Includes all tubers with scab lesions whether merely surface, pitted or otherwise, and regardless of area.
Tubers with any amount of scab are counted in this category.

(4) External defects are scab, growth crack, off-shape, second growth, sun green, and rot.

(5) Internal defects are hollow heart, internal necrosis and vascular discoloration.

New Jersey

Melvin R. Henninger

Introduction

All trials were conducted at the Rutgers Research & Development Center near Bridgeton, NJ in Upper Deerfield Township. All plots were 21' long and 3' wide. Seedpieces were spaced at 9" for round types and 12" for long types. Five hundred lbs./A of 10-10-10 were broadcast and disk-in before planting. Daul and sencor were applied 15 days after planting. Additional 100 lbs./A nitrogen was topdressed 5 weeks after planting.

Colorado Potato Beetles were less troublesome this season than last and control was generally very good. Other insects and diseases were not a problem and did not limit growth. The whole season was cooler than normal with good rainfall. There was 10.9" of rainfall plus irrigation of 6.8".

All plots were harvested with a single-row mount commercial harvester modified for bagging. No attempt was made to recover any lost tubers caused by normal harvester operation. All plots were sized with a spool sizer and specific gravities were determined by weight in air and water. Chip color was done by Mr. Steve Molnar of Wise Foods.

To simplify above information, trade names of some products are used. No endorsement is intended, or is criticism implied of similar products not named.

Generally, 1992 was an excellent growing season with very good yields. The cool early soil conditions favored the potato over the Colorado Potato Beetles which made control of the overwintering adults easier and many fields were not treated until the first eggs hatched.

To take the place of the Colorado Potato Beetles, there was a large population of aphids this year especially melon aphids. Some fields were actually treated more for aphids than potato beetles. During harvest bruising became more of a concern especially with the variety 'Allegany'.

With red and purple-skinned varieties, silver surf was very noticeable in late harvested fields. In some cases there was 50% coverage of this disease at the time of harvest.

New Jersey Table 1. Yields, Specific Gravities, and Tuber Sizes for 20 Early Harvested Potato Varieties Grown on a Sandy Loam Soil at the Rutgers R & D Center - Upper Derrfield, NJ 1992 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)					
			cwt/a	% of Sup.		1	7/8	2		1/2	1	2	3	4	5
Allegany	ne	349	323	92	1.073	93	37	37	0	7	56	29	8	0	
Atlantic	ne	406	385	110	1.086	95	46	46	0	5	49	37	8	0	
Coastal Chip	ne	369	355	101	1.079	97	59	59	1	3	38	43	16	0	
Katahdin	ct	324	297	84	1.066	93	40	40	1	7	52	34	6	0	
Norland D Red	ne	331	309	88	1.065	95	35	35	1	5	60	33	2	0	
Norwis	ct	360	340	97	1.072	94	49	49	0	6	46	37	11	0	
Redsen	ct	350	300	85	1.067	88	23	23	3	12	66	19	4	0	
Steuben	ct	364	344	98	1.072	96	59	59	2	4	37	41	17	1	
Sunrise	ct	370	346	98	1.073	94	37	37	0	6	56	28	10	0	
Superior	ne	375	351	100	1.077	95	50	50	1	5	45	42	8	1	
AF828- 5	ne	364	333	95	1.072	92	43	43	1	8	49	36	6	0	
Portage	pf	526	490	140	1.070	97	62	62	3	4	35	43	18	1	
AF1060- 2	ne	348	317	90	1.071	92	41	41	1	8	51	33	7	0	
B0178-34	cf	351	335	95	1.091	95	58	58	0	5	37	37	21	0	
B0256- 1	cf	366	347	99	1.087	96	56	56	1	4	40	47	8	0	
B0257- 3	cf	332	300	85	1.081	91	35	35	1	9	56	30	5	0	
B0257- 9	cf	293	267	76	1.081	95	58	58	4	5	37	43	15	0	
B0257-12	cf	370	351	100	1.080	96	58	58	2	4	38	45	13	0	
B0674- 9	cf	344	313	89	1.076	91	48	48	0	9	43	42	6	0	
B0874- 1	cf	290	274	78	1.079	94	44	44	0	6	50	37	8	0	
Grand Mean		359	334	95	1.076	94	47	47	1	6	47	37	10	0	
CV		12	13		5.	2	17								
Bayes LSD .05		60	60		.005	2	11		2	2	11	9	7	ns	

- (1) All plots were 21' long and 3' wide with 4 replications. Seedpieces were spaced at 9". Commercial cultural practices were used throughout which included sprinkler irrigation. All plots were planted on April 7 and Harvested on July 15.
- (2) ct = Certified Seed, cf = USDA Chapman Seed Farm, ne = Northeast Regional Project, pf = Porter Farm.
- (3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 2. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for 20 Potato Varieties Harvested Early and grown in Upper Deerfield, NJ - 1992 (1).

Variety	P L A N T					&		TUBER CHARACTERS							T U B E R										D E F E C T S				OVER	
	T	S	A	A	M	C	T	S	D	A	U	E	S	G	S	H	G	S	H	H	H	H	H	N	R	C	C	ALL		
	y	z	p	p	t	l	x	h	p	p	p	n	y	G	C	S	S	R	B	H	H	H	N	R						
Allegany						8	8	2	7	7	7	8	9	9	2	9	8	9	0	0	9							77		
Atlantic						8	7	2	8	8	8	8	9	9	3	9	9	9	0	0	9							88		
Coastal Chip						8	8	2	8	6	5	4	9	9	2	9	9	9	0	0	9							77		
Katahdin						8	8	2	5	7	8	8	9	7	7	2	7	9	0	0	9							76		
Norland Dark Red						2	8	3	6	8	8	8	9	7	5	9	9	9	0	0	9							77		
Norwis						8	9	3	4	6	7	7	9	9	2	9	9	9	0	0	9							76		
Portage						9	8	3	5	7	7	8	9	6	2	9	9	6	0	0	9							77		
Redsen						2	8	2	7	8	8	7	9	7	3	9	9	9	0	0	9							77		
Steuben						7	8	2	8	8	8	7	9	9	1	9	9	9	0	0	9							88		
Sunrise						8	7	3	7	7	7	8	8	9	3	9	9	9	0	0	9							77		
Superior						7	8	5	5	7	7	5	8	9	6	9	9	9	0	0	9							77		
AF 828- 5						8	9	4	7	7	8	7	9	9	2	9	9	9	0	0	9							76		
AF1060- 2						8	8	2	7	7	7	7	9	9	1	9	9	9	0	0	9							87		
B0178-34						8	8	3	5	6	7	7	9	9	4	9	9	9	0	0	9							87		
B0256- 1						7	7	2	6	6	7	7	8	9	4	9	9	9	0	0	9							66		
B0257- 3						8	8	2	6	8	7	7	8	9	3	9	9	8	0	0	9							66		
B0257- 9						8	8	3	5	7	7	5	9	7	2	9	8	9	0	0	9							76		
B0257-12						8	8	3	8	8	8	7	9	7	4	9	8	9	0	0	9							88		
B0674- 9						7	8	2	7	8	7	8	9	7	6	9	9	9	0	0	9							76		
B0874- 1						7	8	2	7	8	7	8	9	9	2	9	9	9	0	0	9							76		

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Table 3. Yields, Specific Gravities, and Tuber Sizes for 24 Midseason Harvested Potato Varieties Grown on a Sandy Loam Soil at the Rutgers R & D Center - Upper Derrfield, NJ 1992 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls			% Tuber Sizes (3)		
						1 7/8 2 1/2			1			1 2 3		
AC Novachip	ne	471	430	109	1.072	94	52	3	6	42	39	14	0	0
Allegany	ne	479	460	116	1.077	97	62	1	3	34	37	25	1	1
Atlantic	ne	503	479	121	1.082	97	61	2	3	36	41	19	0	0
Castile	ne	543	506	128	1.075	95	52	1	5	43	37	15	0	0
Gemchip	ne	445	414	105	1.071	94	58	1	6	36	44	14	1	1
Katahdin	ne	478	426	108	1.065	91	63	2	9	28	32	28	3	3
Kennebec	ne	495	435	110	1.075	94	58	6	6	36	42	16	0	0
Norchip	ne	459	406	103	1.080	92	46	4	8	46	33	13	0	0
Portage	pf	554	503	127	1.071	96	65	6	4	32	39	25	1	1
Spartan Pearl	ne	475	433	109	1.077	93	61	3	7	32	38	23	0	0
Superior	ne	423	394	100	1.073	95	56	2	5	39	44	12	0	0
Yukon Gold	ne	385	359	91	1.078	95	64	2	5	32	40	23	1	1
AF 828- 5	ne	468	442	112	1.071	96	56	1	4	40	36	19	1	1
AF1060- 2	ne	487	441	111	1.072	95	64	5	5	31	39	23	1	1
B0178-34	ne	433	394	100	1.096	94	59	3	6	35	40	19	0	0
B0256- 1	ne	480	452	114	1.090	96	56	2	4	40	38	17	0	0
LA12-59	ne	549	501	127	1.072	96	69	5	4	27	37	31	1	1
MN 12823	ne	608	568	144	1.076	98	71	5	2	27	43	27	1	1
NC 012-18	ne	490	427	108	1.083	89	23	2	11	66	20	3	0	0
NC 012-19	ne	481	440	111	1.086	94	74	2	6	20	42	30	2	2
ND2224-5 red	ne	390	345	87	1.066	90	32	2	10	58	28	4	0	0
NDT91068-11 red	ne	495	422	107	1.066	94	63	11	6	31	34	26	3	3
NY E55-44	ne	399	373	94	1.081	95	46	2	5	49	35	11	0	0
NY 87	ne	463	434	110	1.077	94	54	1	6	41	39	14	0	0
Grand Mean		477	437	110	1.076	94	57	3	6	38	37	19	1	1
CV		11	12		5.	4	16							
Bayes LSD .05		74	81		.005	ns	13	5	ns	10	8	13	ns	ns

(1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/7 and harvested on 8/8.

(2) ne = Northeast Regional Project, pf = Porter Farm.

(3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 4. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for 24 Potato Varieties Harvested Mid-Season and grown in Upper Deerfield, NJ 1992 (1).

Variety	P L A N T					&	TUBER CHARACTERS							T U B E R										D E F E C T S				OVER	
	T	S	A	A	M	C	T	S	D	A	U	E	S	G	S	H	G	S	H	H	N	R	C	C	ALL				
	y	z	p	p	t		l	x	h	p	p	n		y	G	C	S	S	R							B	H	N	R
AC Novachip	8	8	7	7	7	7	8	8	5	6	7	7	8	9	9	7	9	9	9	1	0	9	7	87					
Allegany	9	9	9	7	8	7	8	7	8	2	8	8	8	9	9	3	9	9	9	0	0	9	7	88					
Atlantic	5	7	7	7	5	7	6	2	8	8	8	8	7	9	9	3	9	9	9	2	18	7	6	88					
Castile	8	8	7	7	7	9	8	6	6	5	6	8	8	9	9	2	9	9	9	1	0	9	9	66					
Gemchip	8	8	8	7	8	8	9	2	6	6	6	6	7	9	8	6	9	7	9	1	1	8	8	65					
Katahdin	8	8	7	8	7	8	8	2	6	8	7	8	8	7	8	2	9	7	9	0	4	7	9	77					
Kennebec	6	8	9	7	7	9	9	5	5	7	7	7	7	6	8	2	9	9	9	0	0	9	8	65					
Norchip	5	5	6	6	4	8	8	2	7	7	7	8	8	7	9	8	9	7	9	0	2	8	9	65					
Portage	5	7	7	7	5	8	8	3	6	7	7	7	7	8	7	6	9	9	8	0	12	7	8	77					
Spartan Pearl	6	7	7	8	5	7	7	2	8	8	8	8	8	8	9	7	9	9	9	0	1	8	8	76					
Superior	5	6	7	6	6	7	6	3	7	8	7	5	8	8	9	8	9	9	9	0	0	9	8	88					
Yukon Gold	7	9	7	5	3	8	9	2	6	8	7	8	8	9	9	5	9	8	9	0	4	7	9	78					
AF 828- 5	6	6	8	7	5	7	7	2	6	8	7	7	7	9	9	7	9	9	9	0	0	9	7	77					
AF1060- 2	5	8	7	7	7	8	8	3	7	7	7	6	6	4	9	7	9	9	9	0	0	9	9	55					
B0178-34	6	7	8	7	7	8	8	2	5	7	7	7	7	7	8	4	9	9	6	0	4	8	7	77					
B0256- 1	5	7	7	8	6	6	7	2	6	7	7	9	8	8	9	7	9	9	9	1	3	7	8	78					
LA12-59	6	6	7	6	5	2	8	1	8	8	7	5	8	8	8	5	9	9	9	0	0	9	9	87					
MN 12823	6	9	8	7	6	9	9	3	4	5	3	8	7	7	9	5	9	9	9	1	5	7	9	67					
NC 012-18	5	6	7	7	6	6	7	6	5	5	5	7	7	8	9	4	9	9	9	2	4	6	8	55					
NC 012-19	5	7	7	7	8	7	7	2	3	6	7	5	8	9	9	4	9	7	9	5	1	8	8	67					
ND 2224-5 red	4	5	6	5	2	2	8	4	8	8	8	7	8	9	9	5	9	7	7	0	0	9	8	86					
NDT91068-11 red	6	7	8	7	6	2	8	2	8	7	7	8	7	8	8	7	9	7	9	1	1	8	8	76					
NY E55-44	7	6	6	7	3	6	7	3	7	7	7	8	8	9	9	7	9	9	8	0	0	9	3	77					
NY 87	8	8	8	6	4	8	7	2	8	8	8	6	6	9	9	6	9	8	9	1	0	9	3	88					

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Table 5. Yields, Specific Gravities, and Tuber Sizes for 23 Midseason Harvested Potato Varieties Grown on a Sandy Loam Soil at the Rutgers R & D Center - Upper Derrfield, NJ 1992 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield cwt/a	% of Sup.	Spec. Grav.	% O v e r			% Culls		% Tuber Sizes (3)				
						1	7/8	2 1/2			1	2	3	4	5
Atlantic	ne	492	471	106	1.090	97		67	1		3	30	44	23	0
Coastal Chip	pf	484	439	99	1.078	95		73	5		5	22	29	40	3
Norwis	ct	471	454	102	1.076	98		74	1		2	24	43	30	1
Redsen	ct	388	333	75	1.068	90		36	4		10	54	28	6	1
Snowden	pf	492	465	105	1.087	95		52	1		5	43	42	10	0
Steuben	ct	493	462	104	1.078	95		71	2		5	24	28	37	6
Sunchip (8B)	cf	456	408	92	1.090	96		66	8		4	30	38	28	1
Sunrise	ct	481	448	101	1.069	96		69	3		4	27	41	27	1
Superior	ne	469	441	100	1.073	97		69	3		3	29	50	19	0
B0174-16	cf	425	371	84	1.092	94		62	8		6	32	39	23	0
B0176-24	cf	535	505	114	1.085	97		73	2		3	23	35	34	5
B0178-30	cf	518	458	103	1.087	97		63	9		3	33	35	27	1
B0209-1	cf	472	446	101	1.078	98		83	3		2	14	34	45	4
B0554-1	cf	429	389	88	1.078	93		59	2		7	34	41	18	0
B0564-8	cf	453	416	94	1.077	94		56	2		6	37	34	22	0
B0564-9	cf	486	463	104	1.075	96		71	1		4	25	40	30	0
B0585-5	cf	379	361	81	1.083	98		76	3		2	22	40	34	2
B0613-2	cf	533	476	107	1.074	96		70	7		4	26	37	31	2
B0622-2	cf	484	452	102	1.080	95		60	1		5	34	39	20	2
B0635-6	cf	444	413	93	1.084	95		69	2		5	26	43	26	1
B0676-7	cf	577	513	116	1.074	93		86	3		7	7	21	57	8
B0760-15	cf	470	441	100	1.083	97		69	3		3	29	41	28	0
B0885-3	cf	250	206	46	1.075	83		31	1		17	51	27	4	0
Grand Mean		462	426	96	1.080	95		66	3		5	29	37	28	2
CV		12	13		5.	3		14							
Bayes LSD .05		79	77		.005	5		13	6		5	11	9	15	4

- (1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/7 and harvested on 8/4.
 (2) ct = Certified Seed, cf = USDA Chapman Seed Farm, ne = Northeast Regional Project, pf = Porter Farm.
 (3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 6. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for 23 Potato Varieties Harvested Mid-season and grown in Upper Deerfield, NJ 1992 (1).

Variety	P L A N T					&	TUBER CHARACTERS							T U B E R										OVER		
	T S A A M						C T S D A U E							S G S H G S H										CC		
	y	z	p	p	t		l	x	h	p	p	n	y	G	C	S	S	R	B	H	N	R	H	N	R	CC
Atlantic	6	7	8	7	6	7	6	2	8	8	8	7	9	9	6	9	9	9	9	2	21	6			6	88
Coastal Chip	3	6	7	7	5	8	8	2	8	6	6	4	7	9	5	7	9	9	9	8	12	7			4	77
Norwis	6	7	7	7	6	8	8	3	5	6	6	5	9	9	3	9	9	9	9	2	18	4			3	77
Redsen	3	4	5	4	1	2	8	2	8	7	7	8	9	9	5	9	9	9	9	0	0	9			8	77
Snowden	8	9	9	6	7	7	6	1	9	7	6	5	9	9	6	9	9	9	9	0	0	9			9	77
Steuben	8	8	8	7	8	7	7	2	7	7	7	7	7	9	8	9	9	9	9	2	1	8			9	78
Sunchip (8B)	8	9	9	8	9	8	7	3	7	7	6	7	9	9	7	9	9	9	9	8	0	9			8	77
Sunrise	4	6	7	5	3	8	8	2	8	7	7	8	9	7	6	9	9	9	9	0	0	9			7	77
Superior	5	6	6	7	4	7	6	4	6	7	7	5	7	8	9	9	8	8	0	4	8				8	77
B0174-16	6	7	7	7	9	8	7	3	7	7	7	7	9	9	5	9	9	9	9	2	0	9				66
B0176-24	3	6	7	7	6	8	7	2	8	7	7	7	7	8	6	9	9	9	9	3	1	8			8	98
B0178-30	7	8	9	8	8	8	8	3	6	7	7	7	7	6	8	7	6	8	9	1	1	8				77
B0209- 1	5	6	7	8	7	8	8	4	7	5	6	4	8	9	4	8	9	8	9	4	1	8				76
B0554- 1	2	6	5	6	6	8	8	2	6	6	6	8	5	9	8	9	9	9	9	0	1	8				65
B0564- 8	4	6	6	6	4	8	8	3	8	6	6	6	9	9	7	9	9	9	9	0	0	9				77
B0564- 9	6	8	8	6	4	8	7	2	7	8	7	8	6	9	7	9	9	9	9	8	0	9				88
B0585- 5	5	7	7	6	4	8	8	2	8	8	7	8	9	9	7	9	9	9	9	3	0	9				86
B0613- 2	6	7	7	7	7	7	6	2	8	8	8	8	9	5	6	9	6	9	9	2	4	7				87
B0622- 2	6	6	6	6	3	8	8	2	8	8	8	8	8	9	9	8	9	9	9	3	2	7				88
B0635- 6	5	6	6	4	4	6	7	2	7	7	6	6	7	9	6	9	9	9	9	2	2	8				76
B0676- 7	9	8	8	7	6	8	8	2	8	6	7	7	9	9	5	9	9	9	9	3	0	9				88
B0760-15	3	6	6	7	8	8	7	4	6	6	6	8	9	8	8	9	8	9	9	0	2	8			9	66
B0885- 3	3	4	4	4	2	7	9	2	7	8	7	7	9	9	9	9	9	9	9	0	3	8			4	52

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Table 7. Yields, Specific Gravities, and Tuber Sizes for 24 Late Harvested Potato Varieties Grown on a Sandy Loam Soil at the Rutgers R & D Center - Upper Derrfield, NJ 1992 (1).

Variety Name	Seed Source (2)	Total Market Yield		Spec. Grav.	% O v e r			% Culls		% Tuber Sizes (3)			
		cwt/a	cwt/a		1	7/8	2 1/2			1	2	3	4
Allegany	ne	525	515	1.075	98	98	73	0	2	25	38	36	0
Atlantic	ne	561	546	1.079	98	98	72	1	2	26	46	26	1
Coastal Chip	ne	513	495	1.074	98	98	72	2	2	26	39	34	0
Katahdin	ct	474	450	1.062	95	95	68	0	5	28	38	30	0
Norwis	ct	404	389	1.063	97	97	68	1	3	29	41	26	1
Portage	pf	567	515	1.067	97	97	69	7	3	28	43	26	1
Redsen	ct	366	335	1.064	93	93	36	2	7	57	32	4	0
Steuben	ct	587	545	1.072	98	98	81	5	2	17	25	51	4
Sunchip (8B)	cf	552	475	1.088	92	92	57	7	8	36	41	16	0
Sunrise	ct	453	422	1.066	95	95	48	2	5	47	35	12	1
Superior	ne	423	405	1.071	98	98	53	2	2	44	45	8	0
AF 828- 5	ne	567	535	1.066	95	95	67	1	5	29	45	21	0
AF1060- 2	ne	609	540	1.062	93	93	59	5	7	35	36	22	0
B0178-34	cf	470	435	1.083	96	96	75	4	4	21	39	36	0
B0209- 1	cf	455	444	1.070	99	99	91	2	1	8	30	61	1
B0245-15	cf	323	320	1.071	99	99	83	-	1	16	39	41	3
B0256- 1	cf	457	439	1.074	98	98	75	2	2	22	43	33	0
B0257- 3	cf	376	361	1.081	96	96	63	-	4	33	42	20	0
B0257- 9	cf	303	296	1.075	98	98	76	-	2	22	44	31	1
B0257-12	cf	446	428	1.075	98	98	68	2	2	30	38	30	0
B0396- 1	cf	319	291	--	76	76	0	-	24	76	0	0	0
B0682- 6	cf	451	426	1.070	96	96	69	2	4	27	43	25	1
B0723- 7	cf	528	470	1.061	95	95	72	6	5	23	30	41	1
NY 84	ne	615	576	1.059	95	95	67	2	5	28	33	31	2
Grand Mean		501	469	1.070	96	96	67	3	4	29	38	28	1
CV		11	11	6.	1	1	10	89					
Bayes LSD .05		75	70	.005	2	2	9	4	2	8	9	10	0

- (1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/7 and harvested on 9/1.
- (2) ct = Certified Seed, cf = USDA Chapman Seed Farm, ne = Northeast Regional Project, pf = Porter Farm.
- (3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4.

New Jersey Table 8. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for 24 Potato Varieties Harvested Late and grown in Upper Deerfield, NJ - 1992 (1).

Variety	P L A N T				&		TUBER CHARACTERS						T U B E R										D E F E C T S				OVER	
	T S A A M				C T S D A U E		l	x	h	p	p	n	y	S	G	S	H	G	S	B	H	H	N	R	CC	ALL		
	y	z	p	t	C	T																					S	D

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Table 9. Yields, Specific Gravities, and Tuber Sizes for 12 Russet Potato Selections Grown on a Sandy Loam Soil at the Rutgers Res. & Dev. Center - Upper Deerfield, NJ 1992 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield % of BelRus	Spec. Grav.	% O v e r		% Culls		% Tuber		Sizes (3)		
					4 oz	8 oz			1	2	3	4	5
Belrus	ne	259	201	100	1.077	79	31	2	21	48	27	2	2
Eide Russet	ne	356	188	93	1.069	61	12	14	39	50	10	2	0
Frontier	ne	352	247	122	1.073	74	29	5	26	45	17	8	4
Goldrush	ne	439	310	154	1.062	80	32	12	20	48	25	7	0
Hilite Russet	ne	363	299	148	1.066	83	39	1	17	44	26	9	5
Russet Burbank	ne	406	244	121	1.074	80	36	26	20	44	27	6	4
Russet Norkotah	ne	333	264	131	1.069	83	38	5	17	45	28	7	3
W1005	ne	273	216	107	1.079	84	33	5	16	51	27	4	2
B9922-11	ne	305	243	120	1.077	83	31	4	17	52	24	7	1
B0311- 2	cf	408	307	152	1.078	86	59	13	14	27	32	18	10
B0950- 6	cf	227	178	88	1.070	87	48	9	13	39	32	12	4
Grand Mean		333	243	120	1.072	80	36	9	20	45	26	7	3
CV		11	15		3.	5	22						
Bayes LSD .05		50	52		.003	5	11	5	5	11	11	11	0

(1) All plots were 21' long and 3' wide with 4 reps. Seedpieces were spaced at 9". Commercial cultural practices were used which included irrigation. All plots were planted on 4/7 and harvested on 8/5.

(2) cf = USDA Chapman Seed Farm, ne = Northeast Regional Project.

(3) Size 1 = Under 4 oz, S2 = 4 to 8 oz, S3 = 8 to 12 oz, S4 = 12 to 16 oz, and S5 = Over 16 oz.

New Jersey Table 10. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for 11 Potato Varieties Harvested Mid-season and grown in Upper Deerfield, NJ 1992(1).

Variety	P L A N T & TUBER CHARACTERS										T U B E R D E F E C T S										OVER	
	P L A N T					TUBER CHARACTERS					T U B E R					D E F E C T S					CC	ALL
	T	S	A	A	M	C	T	S	D	A	U	E	S	G	S	H	G	S	H	H		
	y	z	p	p	t	l	x	h	p	p	n	y	G	C	S	S	R	B	H	N	R	
Belrus	3	5	6	6	6	4	3	8	7	7	7	9	8	9	7	9	9	7	5	5	6	87
Eide Russet	6	7	7	7	7	6	7	6	7	5	7	8	3	9	5	5	7	9	0	4	7	42
Frontier	8	7	7	6	7	8	7	8	7	7	6	8	8	9	3	9	9	9	0	4	7	78
Goldrush	6	7	7	7	5	6	7	7	5	6	5	7	7	9	7	9	9	9	0	1	7	88
Hilite Russet	6	6	7	6	6	5	6	8	7	6	5	8	9	9	2	9	9	9	0	1	8	67
Russet Burbank	8	8	7	7	8	8	7	9	7	2	1	7	1	9	4	5	8	9	1	1	7	11
Russet Norkotah	5	5	6	5	4	4	3	8	7	7	6	7	7	9	7	7	9	9	0	0	9	88
W1005	8	7	7	7	8	6	5	8	7	7	6	4	7	7	7	9	9	9	0	0	9	55
B9922-11	5	7	6	5	6	4	3	7	5	7	7	8	8	9	7	7	9	9	0	3	6	65
B0311- 2	5	7	7	7	7	5	4	7	5	7	7	8	7	9	5	7	7	9	0	5	6	75
B0950- 6	4	3	3	6	6	6	5	7	7	6	6	7	7	7	7	9	8	9	0	6	6	75

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Table 11. Yields, Specific Gravities, and Tuber Sizes for 40 Round White & Red Potato Selections Grown on a Sandy Loam Soil at the Rutgers R & D Center - Upper Deerfield, NJ 1992 (1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r				% Culls	% Tuber Sizes (3)				
			% of Sup.	cwt/a		1	7/8	2	1/2		1	2	3	4	5
B0169-56	cf	447	396	90	1.075	89	35		1	11	54	30	5	0	
B0587- 9	cf	453	445	102	1.075	99	69		1	1	30	45	24	0	
B0610- 2	cf	515	458	105	1.081	91	36		2	9	55	35	1	0	
B0615- 1	cf	506	467	107	1.062	98	73		5	2	25	31	39	3	
B0687-14	cf	580	512	117	1.074	92	45		4	8	47	39	6	0	
B0717- 1	cf	512	485	111	1.080	96	52		1	4	44	40	12	0	
B0763-15	cf	512	505	115	1.083	99	75		0	1	23	41	34	0	
B0800-12	cf	502	464	106	1.062	94	62		1	6	32	36	23	3	
B0810- 7	cf	584	555	127	1.085	96	70		1	4	26	41	29	0	
B0850- 8	cf	473	427	97	1.062	93	62		3	7	32	43	19	0	
B0851- 8	cf	648	485	111	1.075	75	57		0	25	18	38	18	0	
B0852- 7	cf	452	434	99	1.074	98	74		3	2	24	45	29	0	
B0856- 4	cf	566	548	125	1.066	98	80		1	2	18	33	47	0	
B0879- 1	cf	581	534	122	1.083	94	51		2	6	43	37	14	0	
B0879- 4	cf	563	501	114	1.070	89	56		0	11	33	49	7	0	
B0892- 7	cf	477	444	101	1.078	95	62		2	5	33	45	18	0	
B0906-13	cf	367	339	77	1.081	93	45		1	7	48	35	11	0	
B0930-13	cf	460	434	99	1.065	94	54		0	6	41	47	6	0	
B0933-14	cf	497	470	107	1.082	95	71		1	5	25	41	30	0	
B0967- 4	cf	417	379	86	1.077	95	49		4	5	46	41	8	0	
B0967-11	cf	474	455	104	1.077	96	65		0	4	31	37	29	0	
B0972-10	cf	516	440	100	1.060	97	70		12	3	27	41	29	0	
B0975- 1	cf	567	555	127	1.065	99	89		1	1	10	38	51	0	
B0981- 3	cf	427	389	89	1.083	93	46		2	7	47	44	2	0	
B0984- 1	cf	481	457	104	1.082	98	77		3	2	21	37	40	0	

New Jersey Table 11. (Continued).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)				
			cwt/a	% of Sup.		1	7/8	2		1/2	1	2	3	4
B0984- 2	cf	347	311	71	1.077	90	34	0	10	56	30	4	0	
B0985- 7	cf	555	492	112	1.071	95	71	6	5	24	37	34	0	
B0994- 3	cf	662	639	146	1.063	98	72	1	2	25	38	34	0	
B1010-18	cf	437	358	82	1.077	95	59	14	5	37	47	12	0	
B1036- 6	cf	517	469	107	1.068	94	63	4	6	32	44	19	0	
B0884-10 SG	cf	396	370	84	1.073	95	51	2	5	44	45	5	0	
B0933- 7 SG	cf	454	415	95	1.070	95	59	4	5	36	36	23	0	
AF1331- 2	me	548	501	114	1.074	97	70	6	3	27	45	25	0	
AF1424- 6	me	445	420	96	1.054	98	85	4	2	13	35	46	5	
AF1527- 3	me	444	409	93	1.076	93	51	1	7	42	42	9	0	
AF1556-14	me	463	434	99	1.074	97	73	3	3	24	43	29	0	
AF1559- 5	me	513	451	103	1.072	94	52	7	6	42	43	9	0	
AF1566-10	me	483	442	101	1.063	94	64	3	6	30	43	21	0	
AF1569- 2	me	598	566	129	1.069	95	65	1	5	31	41	22	2	
AF1569- 3	me	483	459	105	1.071	96	45	1	4	51	40	5	0	
Atlantic	ne	502	475	109	1.085	87	63	2	3	34	43	19	1	
Redsen	ct	338	286	65	1.064	84	29	5	11	58	27	4	0	
Superior	ne	454	436	100	1.073	97	62	1	3	35	47	14	0	
Cherry Red	pf	492	438	100	1.078	94	55	5	6	39	39	17	0	

- (1) All plots were 21' long and 3' wide with no replications. Seedpieces were spaced at 12". Commercial cultural practices were used throughout which included sprinkler irrigation. All plots were planted on April 7 and harvested on August 7.
- (2) ct = Certified Seed, me = Univ. of Maine, ne = NE Reg Project, pf = Porter Farm, cf = USDA Chapman Farm.
- (3) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4

New Jersey Table 12. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for 40 Potato Varieties Harvested Mid-season and grown in Upper Deerfield, NJ 1992(1).

Variety	P L A N T					& TUBER CHARACTERS					T U B E R D E F E C T S										OVER		
	T S A		A P t		A M	C T S	D A U E	S G S			H G S			H		CC	ALL						
	y z p	y z p	y z p	y z p	y z p	l x h p	A U E	G C S	G C S	S R B	S R B	H N R	H N R										
B0169-56	5	5	5	7	5	5	3	8	7	6	6	8	8	9	7	9	9	9	0	0	9		77
B0587- 9	6	5	5	2	3	8	8	3	7	6	5	8	9	9	7	9	9	9	1	0	9		67
B0610- 2	6	6	7	7	4	7	6	2	6	6	5	7	7	9	6	9	9	9	0	3	8		67
B0615- 1	7	7	7	6	5	2	7	2	8	7	6	6	7	9	6	9	9	9	0	0	9		78
B0687-14	5	7	7	6	7	8	8	3	6	6	8	5	7	9	7	9	9	9	0	1	8	9	77
B0717- 1	7	7	6	7	5	8	7	2	7	8	8	7	9	7	7	9	9	9	2	3	7	6	88
B0763-15	7	7	7	8	7	8	8	2	8	9	8	7	9	9	6	9	9	9	1	0	9		98
B0800-12	7	7	6	4	3	2	8	2	6	6	6	5	9	9	5	9	8	9	2	2	7		77
B0810- 7	8	9	9	7	8	8	8	2	6	7	7	8	9	9	6	9	9	9	4	2	4		77
B0850- 8	3	6	6	5	2	8	8	4	6	7	7	8	9	9	8	9	9	9	0	0	9	8	78
B0851- 8	5	7	7	6	3	8	8	2	8	7	8	4	9	9	7	9	9	9	0	0	9		88
B0852- 7	8	8	8	7	7	1	8	2	6	7	8	8	9	9	6	9	9	9	0	0	9		78
B0856- 4	6	7	7	6	4	8	9	2	6	7	6	5	8	9	5	9	9	9	0	0	9	6	88
B0879- 1	5	4	3	4	2	8	7	2	7	6	6	6	8	9	6	9	9	9	1	0	9		78
B0879- 4	4	5	4	3	1	8	8	3	7	7	7	8	9	8	9	9	9	9	0	2	7		68
B0892- 7	7	8	7	6	6	8	7	2	6	7	7	8	7	9	3	9	9	9	0	3	7		77
B0906-13	5	7	7	7	4	8	7	2	8	8	8	8	9	9	8	9	8	9	0	0	9	6	87
B0930-13	2	4	6	7	4	7	6	3	7	8	8	7	9	9	6	9	9	9	2	0	9	9	98
B0933-14	6	7	7	7	5	8	8	2	7	7	7	7	7	7	7	7	8	9	1	0	9	6	88
B0967- 4	8	6	6	7	9	1	8	4	6	7	8	6	8	9	4	9	9	9	0	0	9		57
B0967-11	8	8	8	6	9	1	8	2	7	8	8	8	9	9	5	9	9	9	0	0	9	7	88
B0972-10	5	6	6	4	4	2	8	2	7	8	8	7	8	9	6	9	9	9	0	0	9		78
B0975- 1	7	7	6	5	3	1	8	3	7	7	6	5	9	9	4	9	9	9	1	1	8		78
B0981- 3	8	8	6	5	3	6	7	2	7	8	7	8	9	8	7	9	9	9	1	0	9		77
B0984- 1	7	8	7	7	8	2	7	2	8	8	6	6	7	9	5	9	9	9	0	0	9		78

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Table 12. (Continued).

Variety	P L A N T					TUBER CHARACTERS					T U B E R D E F E C T S										OVER ALL		
	T S A A M					C T S D A U E					S G S H G S H					S G S H G S H							
	y	z	p	p	t	l	x	h	p	p	n	y	S	G	S	H	G	S	H	N		R	C
B0984- 2	5	6	6	6	2	8	8	2	6	8	7	8	9	9	8	9	9	9	0	1	6		55
B0985- 7	2	5	5	3	1	1	8	5	7	7	7	8	9	9	3	9	9	9	0	0	9		88
B0994- 3	4	7	7	6	2	2	6	2	7	8	8	7	9	7	6	9	9	9	0	0	9		78
B1010-18	2	4	6	5	3	8	8	3	6	8	8	8	9	9	5	9	9	9	0	0	9	5	78
B1036- 6	6	7	8	4	3	8	7	5	8	6	8	8	8	7	6	9	9	9	0	0	9	9	77
B0884-10 SG	3	5	6	6	2	7	6	2	7	7	9	7	9	9	7	9	8	9	0	0	9		77
B0933- 7 SG	3	4	4	6	3	7	7	3	7	8	5	6	7	9	7	9	9	9	1	0	9		77
AF1331- 2	7	8	7	5	5	8	9	2	3	5	2	7	6	8	4	9	6	9	0	4	7		57
AF1424- 6	6	6	7	6	6	8	8	3	7	6	6	8	9	9	2	9	9	9	1	0	9		77
AF1527- 3	6	6	7	7	4	8	8	2	8	8	7	7	9	9	3	9	9	9	0	0	9	9	77
AF1556-14	6	6	7	7	8	7	7	2	7	8	8	8	9	8	3	9	9	9	0	0	9	8	88
AF1559- 5	6	6	6	7	7	8	8	2	7	7	7	7	9	9	6	9	9	9	0	2	7		78
AF1566-10	2	5	6	6	5	8	8	1	9	8	8	6	9	7	7	9	8	9	0	0	9	9	88
AF1569- 2	6	7	8	7	7	8	7	2	7	8	7	6	9	9	6	9	9	9	0	1	8	8	88
AF1569- 3	8	8	8	5	5	8	7	4	7	7	5	7	9	9	7	9	9	9	0	0	9	9	67
Superior ck	5	6	7	6	4	7	6	4	6	7	7	5	7	8	8	9	8	8	1	4	7	8	77
Atlantic ck	6	8	8	7	6	6	6	2	8	8	8	7	9	9	6	9	9	9	3	24	6	6	88
Redsen ck	4	5	5	4	1	2	8	2	8	7	7	8	9	9	2	9	9	9	1	0	9		77
Cherry Red	8	8	8	8	6	2	7	2	7	8	8	7	8	6	7	9	8	9	0	0	9		67

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Table 13. Yields, Specific Gravities, and Tuber Sizes for 12 Russet Potato Selections Grown on a Sandy Loam Soil at the Rutgers Res. & Dev. Center - Upper Delford, NJ 1992(1).

Variety Name	Seed Source (2)	Total Yield cwt/a	Market Yield		Spec. Grav.	% O v e r			% Culls	% Tuber Sizes (3)			
			cwt/a	% of BelRus		4 oz	8 oz	% Tuber Sizes (3)					
								1		2	3	4	5
BelRus	ne	307	225	100	1.080	74	30	1	26	44	21	7	2
Russet Burbank	ne	436	263	116	1.071	79	33	24	21	47	27	2	4
Russet Norkotah	ne	327	278	123	1.070	85	43	0	15	42	31	8	4
AF1515-1	me	378	323	143	1.068	89	43	4	11	46	28	11	3
AF1521-4	me	425	317	140	1.077	79	40	5	21	39	17	17	5
B0186- 1	cf	420	380	169	1.083	91	59	7	3	31	36	27	0
B0338- 2	cf	301	230	102	1.071	81	23	5	19	58	23	0	0
B0835- 4	cf	282	220	97	1.064	82	45	6	18	38	35	10	0
B0835-11	cf	348	298	132	1.073	86	49	0	14	37	30	10	9
B0839- 3	cf	345	292	129	1.073	96	70	12	4	26	25	30	16
B0880-15	cf	332	263	116	1.075	84	73	6	16	11	50	17	7
B0881-22	cf	371	268	119	1.077	78	54	7	22	24	29	13	12

(1) All plots were 21' long and 3' wide with no replications. Seedpieces were spaced at 12". Commercial cultural practices were used throughout which included sprinkler irrigation. All plots were planted on April 7 and harvested on August 5.

(2) cf=USDA Chapman Seed Farm, me=Maine Breeding Project, ne=Northeast Regional Project, pf=Porter Farm.

(3) Size 1 = Under 4 oz, S2 = 4 to 8 oz, S3 = 8 to 12 oz, S4 = 12 to 16 oz, and S5 = Over 16 oz

New Jersey Table 14. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for 12 Potato Varieties Harvested Mid-season and grown in Upper Deerfield, NJ 1992(1).

Variety	P L A N T				& TUBER CHARACTERS				T U B E R D E F E C T S										OVER	
	T	S	A	A	M	C	T	S	D	A	U	E	S	G	S	H	G	S	H	H
	Y	Z	P	P	T	L	X	H	P	P	N	Y	G	C	S	S	R	B	H	N
Belrus	3	5	6	6	6	4	3	8	7	7	7	9	8	9	7	9	9	7	5	5
Russet Burbank	9	9	9	8	8	7	7	9	8	3	2	8	1	6	3	9			0	1
Norkotah Russet	5	4	5	6	2	4	3	8	7	7	7	6	9	9	4	9	9	9	0	0
AF1515- 1	2	5	6	5	2	7	8	8	8	8	7	7	9	9	7	9	9	7	0	0
AF1521- 4	6	6	8	7	5	4	3	8	6	7	7	8	8	9	4	7	9	9	0	0
B0186- 1	5	7	6	7	5	4	3	8	6	7	7	8	8	7	7	9	8	9	0	0
B0338- 2	3	6	7	5	1	5	5	8	7	7	6	8	8	7	8	9	9	9	0	2
B0835- 4	3	3	6	6	3	4	2	7	6	7	7	9	7	9	8	9	9	9	0	0
B0835-11	6	6	7	8	6	5	4	8	5	7	6	6	9	9	6	9	9	9	0	0
B0839- 3	5	6	7	8	7	5	4	8	6	7	7	8	7	7	3	9	9	9	1	1
B0880-15	6	6	7	7	5	5	4	8	6	7	5	8	6	9	7	8	9	8	0	0
B0881-22	6	5	6	7	5	5	3	8	7	6	7	8	6	9	7	9	9	9	0	0

(1) See NJ Rating Table 15 for plant and tuber characters, tubers defects and chip color ratings.

New Jersey Rating Table 15. Codes and ratings for plant and tuber characters, tuber defects and chip color.

Plant Characters		Tuber Characters		Tubers Defects		Defect Rating		Ty = Plant Type	
Ty = Type		Cl = Color		SG = Second Growth		1 = Dead		1 = V. decumbent	
Sz = Size		Tx = Texture		GC = Growth Crack		2 = Very Severe		2 =	
Ap = Appearance		Sh = Shape		SS = Skin Set		3 = Severe		3 = decumbent	
AP = Air Pollution		Dp = Depth		HS = Heat Sprouts		4 =		4 =	
Mt = Vine Maturity		Ap = Appearance		GR = Green Tubers		5 = Moderate		5 = Spreading	
		Un = Uniformity		SB = Scab		6 =		6 =	
		Ey = Eye Depth		HH = No. of Hollow Heart		7 = Slight		7 = Upright	
				HN = No. of Heat Necrosis		8 = Very Slight		8 =	
				R = Heat Nec. Rating		9 = No Symptoms		9 = Very Upright	

Plant / Tuber		Plant / Tuber		Plant / Tuber		Plant / Tuber		Plant / Tuber	
Sz=Plant Size		AP=Appearance		AP=Air Pollution		Mt=Vine Maturity		Cl=Tuber Color	
1 = V. Small		1 = Very poor		1 = Dead		1 = Very Early		1 = Purple	
2 =		2 =		2 =		2 = Early		2 = Red	
3 = Small		3 = Poor		3 = Mod. Defol		3 =		3 = Pink	
4 =		4 =		4 =		4 = Med Early		4 = Dark Brown	
5 = Medium		5 = Fair		5 = Mod Injury		5 = Medium		5 = Brown	
6 =		6 =		6 =		6 = Med Late		6 = Tan	
7 = Large		7 = Good		7 = Mild Injury		7 =		7 = Buff	
8 =		8 =		8 =		8 = Late		8 = White	
9 = V. Large		9 = Excellent		9 = No Symptoms		9 = Very Late		9 = Bright White	

Sh=Tuber Shape		Dp=Tuber Depth		Un=Tuber Uniformity		Ey=Eye Depth		CC=Chip Color		Overall	
1 = V. Round		1 = V. Flat		1 = V. Variable		1 = V. Deep		1 = Paper white		1 = Discards	
2 = Round		2 =		2 =		2 =		2 =		2 =	
3 = Round-oblong		3 = Flat		3 = Variable		3 = Deep		3 =		3 =	
4 = Mostly Oblong		4 =		4 = Unacceptable		4 =		4 = Acceptable		4 =	
5 = Oblong		5 = Acceptable		5 =		5 = Medium		5 = Borderline		5 = Some Merit	
6 = Mostly Oblong		6 =		6 = Acceptable		6 =		6 = Unacceptable		6 = Try Again	
7 = Mostly Long		7 = Good		7 =		7 = Shallow		7 =		7 = Good	
8 = Long		8 =		8 =		8 =		8 =		8 = Excellent	
9 = Cylindrical		9 = V. Round		9 = V. Uniform		9 = V. Shal.		9 = Black chip		9 = Name It	

1992 Results of Potato Variety and Cultural Practice Studies on Long Island, New York

J. B. Sieczka, I. D. Rybus, R. C. Neese and D. D. Moyer

Introduction

Experiments conducted in 1992 are part of an ongoing program evaluating promising golden nematode resistant and russet- and red-skinned potato clones under Long Island conditions. Forty-five potato clones were evaluated in replicated experiments conducted at the Long Island Horticultural Research Laboratory and at Corwith Farms, Water Mill, New York. Data were collected on total and marketable yields, size distribution, internal and external defects and general appearance of potato tubers.

Experiments designed to determine the effect of various cultural practices on Norwis tuber yield, size and appearance were conducted in 1992. The variables investigated were: spacing (8 vs. 12"), seed size (1.0, 1.5, 2.0 and 2.5 oz) and nitrogen fertilization (100, 160 and 220 lbs/A). The 1992 growing season was categorized as cool and wet.

Methods

The experimental design for the variety experiments was a randomized complete block. Plot size was 2 rows by 12 feet. Four replications were generally used. Three replications were used in the Water Mill experiment. At Riverhead, fertilizer was applied at a rate of 1000 lbs/A of 10-20-20 in bands at time of planting (4/7-8/92). An additional 60 lbs N/A were applied when plants were 4 to 6 inches tall. The Water Mill experiment was fertilized at a rate of 1800 lbs/A of 10-20-10 at planting (4/16/92). Supplemental nitrogen at a rate of 40 lbs/A was applied. Irrigation was not used at this location. Vine maturity was rated on 8/3/92 and 8/25/92 for the experiments at Riverhead. The other experiments at Riverhead were vine killed on 9/1/92 and the one at Water Mill on 8/29/92. The experiments with white-skinned clones were harvested on 9/14/92. The red and russet experiments were harvested on 9/21/92. The Water Mill experiment was harvested on 10/13/92. Specific gravity was determined by the hydrometer method. Internal defects were determined on 10 tubers per replication in the 3.3 to 4 inch or 12 to 16 oz. categories

for round and russet experiments, respectively. Tables summarize maturity ratings, tuber appearance and shape. Vine maturity ratings were based on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous. Appearance ratings were based on a scale of 1 to 9, 1 = extremely poor, 9 = excellent appearance. Shape abbreviations are R = round, O = oblong, L = long. Other data on tuber appearance, shape, skin color and texture and eye-depth are listed in Table 1. Abbreviations for the descriptions are also listed for that table.

NE-107 Main Season, White

Highest yields were produced by Allegany, Castile, AF828-5 and Norwis (Tables 2 and 3). Lines that produced the highest tuber specific gravity were Atlantic and B0178-34. Defects were most prevalent in Kennebec, Katahdin, B0178-34. Internal defects were also a major problem in Katahdin, Norwis and Atlantic.

Advanced White Skin Clones

Entries in this experiment yielded at or below the level of Katahdin. Lines with high tuber specific gravity were B0256-1, Mainechip and NY95 (Tables 4 and 5). The clone MN12823 was plagued with the high percentage of internal and external effects. Other lines with a significant amount internal defects were NC012-18 and NC012-19.

Water Mill

The highest yielding line was AF1060-2 (Table 6). This line produced a high percentage of small to medium size tubers. Other high yielding entries were Norwis, Allegany and NY84. Brown center was a problem in Allegany and Chieftain. Other entries with internal defect problems were Katahdin, Norwis and NY84. The red-skinned clones, ND2224-5R and ND1068-11R, had attractive appearance and deep red skin color. ND1068-11R tubers skinned readily.

Miscellaneous

Spartan Pearl produced 20% more marketable tubers than Yukon Gold (Tables 7 and 8). The tuber specific gravity of both clones was identical. Hollow heart was a major problem in Yukon Gold tubers.

Red-skinned clones

Highest yielding lines were Chieftain, LA12-59 and ND1068-11R. Chieftain tubers were light red (Tables 9 and 10). ND 2224-5R tubers had the best appearance and deep red color. ND1068-11R and LA12-59 tubers also had dark red skin but skinned badly. Most defects were found in D191-103 DR and ND1068-11R.

Russet-skinned clones

The russet line that produced the highest yield of marketable tubers was W1005RUS (Tables 11 and 12). This clone and B9922-11 had high specific gravity. Internal defects were significant in many lines in this experiment. BelRus, Russet Burbank, Russet Norkotah, B0186-1, and B9922-11 had a high percentage of hollow heart and/or internal necrosis.

Observation Trial

Data from a non-replicated trial on yield, appearance, specific gravity and internal defects of early selection clones and recently released varieties are presented in Table 13.

Norwis: Size Reduction Study

Both seed size and seed spacing affected total and marketable yields (Table 14). The 1.0 oz seed size resulted in the lowest yields of total and marketable (2 to 4 inch) tubers at both the 8 and 12 inch spacing. Tuber size tended to increase with decreasing seed size or at the 12 inch spacing. Highest yields were attained at seed sizes of 1.5 and 2.0 oz. Yields were generally higher at the 8 inch spacing. Tuber number increased as seed size increased. Although the percentage of tubers with hollow heart did not vary due to treatment, the number of large tubers did. The study showed that

'Norwis' tuber size can be reduced by planting at 8 inches and maintaining a tuber size of 1.5 to 2 oz. The closer spacing and the 2.5 oz seed size tended to improve appearance of 'Norwis' tubers. However, there appeared to be no advantage to planting seed pieces greater than 2.0 oz.

Norwis: Nitrogen Fertilization

All treatments received 100-200-200 at planting. Treatments were supplemental nitrogen applications of 0, 60 and 120 lb N/A. The results show that tuber size and total and 2 to 4" yields increased and specific gravity decreased with increasing nitrogen rate (Table 15). Last year there was no difference in total or marketable yield between 150 and 200 lb N/A.

Norwis: Date of Planting

Potatoes were planted on 4/9/92, 5/5/92, and 6/3/92. There was no significant difference in yield between the 4/9/92 and 5/5/92 planting dates in either total or marketable yield (Table 16). Yields from the last planting were significantly lower than from the earlier plantings. Specific gravity and tuber number tended to increase as planting dates were delayed.

Storage Results

After-cooking darkening and blackspot ratings for clones grown in 1991 are given in Table 17.

Acknowledgments

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Long Island Table 1. Tuber characteristics of potato clones grown on Long Island, N.Y.-1992.

CLONE	Table	Color	Texture	Shape	Depth	Eye Depth		Appear- ance	Comments
						Lateral	Apical		
Katahdin	2,3,4,5,6	W	RS	R-O	SF	S	MD	6	Sl Irr
Superior	2,3,4,5,6	Bu	SN	O-R	SF	MD	MD-D	6	Irr
Allegany	2,3,6	Bu	SN	R	R	S	MD-D	7	
Atlantic	2,3	Bu	SN	R	R	S	MD	6	
BelRus	11,12	B	HR	L	SF	S	S	7	
Castile	2,3,6	W	S	O	SF	S	S	7	Sl Irr
Chieftain	6,9,10	LR	S	O-R	MT	MS	MS	7	
Eide Russet	11,12	B	MR	L	MT	S	S	6	
Gemchip	2,3	W	S	R	R	S	S	7	OK
HiLite Russet	11,12	T	LR	L	MT	S	S	6	Sl Irr
Kennebec	2,3	W	S	O	SF	S	MD	4	Irr, RLN
MaineChip	4,5	W	RS	R-O	MT	S	MD	6	Sl Irr
Norchip	2,3	W	S	R	MT	S	MD-D	5	Sl Irr
Norland	9,10	LR	S	O-R	MT	MS	MS	6	
Norwis	2,3,6	W	S	O	MT	MS	MD-D	6	Sl Irr, Lt Y
R. Burbank	11,12	B	M-LR	L	R	MS	MS	4	Irr, Kn
Russet Norkotah	6,11,12	B	MR	L	R	S	S	6	Sl Irr
Spartan Pearl	7,8	W	S	R	MT	S	MD	6	DSE
Yukon Gold	7,8	Y-W	S	R-O	MT	S	MS	6	Sl Irr, Lt Y
AF 828-5	2,3,6	W	RS	O	MT	S	MD	7	Sl Irr
AF1060-2	6	W	S	R	R	MS	MD	7	
B0178-34	2,3	Bu	SN	R-O	MT	S	MD	5	Irr, Sc
B0186-1	11,12	B	MR	L-O	SF	S	S	7	
B0256-1	4,5	Bu	SN	R	MT	S	MD	6	Irr, Sc
B0257-12	4,5	Bu	SN	R	MT	S	MS	7	Variable
B0306-6	11,12	B	MR	L	R	S	S	7	
B0311-2	11,12	B	HR	L	MT	S	S	6	Sl Irr
B0329-1	11,12	B	PR	L	R	S	S	6	Sl Irr
B0616-1	9,10	R	SN	R	R	S	MS	5	Irr, Sc
B9922-11	6,11,12	B	HR	O-L	SF	S	S	7	Irr
LA12-59	9,10	DR	S	R	R	S	MD	6	Sk, Irr
MN12567	4,5	W	RS	O-R	SF	S	MS	7	OK
MN12823	4,5	W	S	O	F	MD	MD	3	Irr, Rot
MN13540	4,5	W	S	O	MT	S	S	8	
NC012-18	4,5	Bu	SN	R-O	MT	S	MD	4	Irr
NC012-19	4,5	Bu	SN	R	SF	S	MD	5	Irr, DSE
ND1538-1RUS	11,12	B	MR	L	SF	S	S	6	Irr
ND2224-5R	6,9,10	DR	S	R	R	S	S	9	Small
NDT9-1068-11R	6,9,10	DR	S	O-R	MT	S	S	7	Sk, Irr, Sc
NY84	2,3,4,5,6	W	RS	O-R	SF	S	MS	7	
NY86	2,3	W	RS	O	MT	S	S	8	OK
NY87	2,3,6	W	RS	O-R	MT	S	MD	7	
NY88	4,5	W	RS	R-O	MT	S	MS	7	Small
NY94	4,5	Bu	SN	R	MT	S	MS	7	DSE, Sl Irr
NY95	4,5	W	RS	O	MT	S	MS	7	Sl Irr
NYD191-103DR	9,10	R	SN	R	R	MD	MD	5	Star lesion, Irr
NYE11-45	2,3,6	W	S	R-O	MT	S	MS	7	
NYE55-44	2,3,4,5	Bu	SN	R-O	MT	S	S	8	
Purple 5	9,10	Pu	S	O	SF	S	S	8	
W1005RUS	11,12	B-T	MR	L	R	S	S	6	Cylindrical

COLOR: B=brown, Bu=buff, R=red, W=white. Modifiers: L=light, M=medium, D=dark.

TEXTURE: N=netted, R=russet, S=smooth. Modifiers: H=heavy, M=moderate, R=Relatively, S=Slightly.

SHAPE: L=long, O=oblong, R=round.

EYE DEPTH: D=deep, M=moderate, S=shallow.

TUBER DEPTH: MT=medium thick, R=round, SF=slightly flattened.

COMMENTS: L=prominent lenticels, PE=pinkeye, DSE=deep stem end, Irr=irregular, Kn=knobs, Lt=light

RLN=root lesion nematode damage, Rg=Rough, Sc=scab, Sl=slightly, Sk=skinned, Sm=small, Sp=sprouts, Y=Yellow.

Long Island Table 2. Yield, marketable yield, percentage of yield by grade, size distribution, and specific gravity for main season white-skinned clones grown at Riverhead, N.Y. - 1992.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution			Specific Gravity
		cwt/A	percentage of standard	<2"	2 to 3.25 to			2 to 4 in.	2.5 to 4 in.			
					2.5"	3.25"	4"					
Season-147 days												
Katahdin	456	350	100	21	12	56	9	2	77	65	67	
Superior	403	349	100	13	19	66	2	0	87	68	71	
Allegany	586	530	152	8	7	69	15	1	91	84	77	
Atlantic	531	467	133	12	11	64	13	0	88	77	84	
Castile	592	513	147	13	19	53	15	0	87	68	75	
Gemchip	511	451	129	12	15	64	10	0	88	73	76	
Kennebec	536	392	112	27	14	50	9	0	73	59	73	
Norchip	405	326	93	19	19	54	7	0	80	61	75	
Norwis	543	489	140	5	6	62	21	5	90	84	67	
AF 828-5	579	497	142	13	10	62	14	1	86	76	74	
B0178-34	561	433	124	21	10	54	14	1	77	68	89	
NY84	537	457	131	14	13	61	10	1	85	72	60	
NY86	443	392	112	11	13	64	12	0	89	76	68	
NY87	489	432	123	12	17	66	5	0	88	71	71	
NYE11-45	555	444	127	19	18	56	6	1	80	62	61	
NYE55-44	477	429	123	10	16	70	4	0	90	74	79	
Waller-Duncan												
LSD (K=100,5 %)	(66)	(59)									(4)	
Planted: 4/7/92, Fertilizer rate: 100-200-200 /A plus 60 lb N/A sidedressed, Vine killed: 9/1/92, Harvested: 9/14/92.												

Planted: 4/7/92, Fertilizer rate: 100-200-200 /A plus 60 lb N/A sidedressed, Vine killed: 9/1/92, Harvested: 9/14/92.

Long Island Table 3. Maturity, tuber shape, and internal and external defects for white-skinned clones grown at Riverhead, N. Y. - 1992

Clone	Maturity on 8/25/92*	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.		
Season-147 days													
Katahdin	3	R - O	6	12	4	1	1	6	8	3	0	0	
Superior	2	O - R	5	4	1	2	0	1	0	0	0	0	
Allegany	5	R	7	5	3	2	0	0	0	5	0	0	
Atlantic	3	R	6	4	2	1	0	1	10	5	0	3	
Castile	5	O	7	6	3	2	0	1	0	0	0	0	
Gemchip	4	O - R	7	5	3	0	0	1	0	0	0	0	
Kennebec	4	O	4	21	6	11	1	3	5	0	3	0	
Norchip	2	R	6	7	1	4	0	2	0	3	0	0	
Norwis	3	O	6	2	1	1	0	0	13	0	5	0	
AF 828-5	6	O	6	7	3	1	3	1	0	0	3	0	
B0178-34	5	R - O	6	12	2	1	0	9	3	3	0	3	
NY84	3	O - R	7	3	1	1	0	0	0	0	0	0	
NY86	2	O	8	4	2	1	0	1	8	0	0	0	
NY87	2	O - R	7	3	1	1	0	1	3	3	0	0	
NYE11-45	6	R - O	7	7	4	2	0	1	3	0	3	0	
NYE55-44	2	O - R	8	4	3	0	0	1	0	0	0	0	

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 4. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for white-skinned clones grown at Riverhead, N.Y. - 1992

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution			Specific Gravity
		cwt/A	percentage of standard	<2"	2 to 3.25 to			2 to 4 in.	2.5 to 4 in.			
					2.5"	3.25"	4"			>4"		
Season-147 days												
Katahdin	535	461	100	11	13	62	11	2	86	73	69	
Superior	459	397	86	14	18	66	3	0	86	69	72	
MaineChip	448	393	85	12	22	62	3	0	88	66	86	
MN12567	508	426	92	16	23	58	2	0	84	61	68	
MN12823	639	519	113	18	20	55	6	1	81	62	76	
MN13540	555	461	100	17	32	50	0	0	83	51	67	
NC012-18	517	389	84	25	25	48	2	0	75	50	79	
NC012-19	551	495	107	9	8	76	6	2	90	82	77	
NYE55-44	458	406	88	11	21	67	1	0	89	68	77	
NY88	426	336	73	20	26	50	3	1	79	53	75	
NY94	519	463	100	11	20	66	3	0	89	69	75	
NY95	517	435	94	14	17	63	4	2	84	67	85	
B0256-1	548	501	109	8	10	74	7	1	92	82	87	
B0257-12	427	381	83	11	15	69	5	0	89	74	75	

Waller-Duncan												(3)
LSD (0.05)												(76)
(80)												(3)

Planted: 4/7/92, Fertilizer rate: 100-200-200 /A plus 60 lb N/A sidedressed, Vine killed: 9/1/92, Harvested: 9/14/92.

Long Island Table 5. Maturity, tuber shape, and internal and external defects for white-skinned clones grown at Riverhead, N.Y. - 1992

Clone	Maturity on 8/25/92*	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.		
Season-147 days													
Katahdin	2	R-O	6	3	2	0	0	1	13	3	0	0	0
Superior	2	O-R	6	5	1	4	0	0	3	0	3	0	0
MaineChip	2	R-O	6	2	1	0	0	0	8	0	0	0	0
MN12567	2	O-R	7	4	1	1	1	1	0	0	0	0	0
MN12823	5	O	4	10	1	7	0	2	0	58	3	0	0
MN13540	3	O	8	3	1	2	0	0	0	5	0	0	0
NC012-18	3	R-O	5	6	2	4	0	0	15	3	5	0	0
NC012-19	3	R	6	4	1	1	1	1	15	0	0	0	0
NYE55-44	2	R	7	4	1	2	0	0	0	0	0	0	0
NY88	2	R-O	7	3	0	2	0	0	0	0	0	0	0
NY94	3	R	7	4	0	2	1	0	5	0	0	0	0
NY95	3	O	7	4	1	2	0	0	8	0	0	0	0
B0256-1	3	R	6	3	1	1	1	1	5	0	0	0	0
B0257-12	3	R	8	2	0	1	0	0	0	0	0	0	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 6. Yield, marketable yield, percentage of yield by grade, size distribution and defects for white-, russet-, and red-skinned clones grown at Water Mill, N.Y. - 1992

Clone	Yield cwt/A	Marketable Yield cwt/A	Yield percentage of standard	Size Distribution (%) [*]			Tuber Data ^{**}	Percentage						
				1	2	3		Shape	Appear- ance	Defects	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.	
Season-135 days														
Katahdin	539	495	100	6	94	1	R-O	7	2	7	7	0	3	0
Superior	507	458	92	8	92	0	R-O	6	2	0	0	0	0	0
Allegany	615	581	117	4	96	0	R	7	1	3	10	0	0	0
Castile	598	537	108	6	93	1	O	7	4	0	0	0	0	0
Norwis	640	603	122	4	96	1	O-R	6	2	7	7	3	0	0
R. Norkotah ^o	409	277	56	31	69	1	L	7	1	3	0	0	3	0
AF 828-5	582	551	111	4	96	0	O-R	7	1	0	3	3	0	0
AF1060-2	767	688	139	9	91	0	R	7	1	7	0	0	0	0
B9922-11 ^o	480	374	76	16	81	3	O	6	3	0	0	0	0	0
NY84	607	561	113	6	93	1	R-O	8	1	3	7	0	3	0
NY87	547	504	102	7	93	1	R-O	7	0	7	0	0	0	0
NYE11-45	556	487	98	11	89	0	R-O	7	1	3	7	0	0	0
NYE55-44	453	409	83	8	92	0	R	7	2	0	3	0	0	0
Chieftain ^{oo}	569	499	101	11	89	0	R-O	7	1	0	13	0	0	0
N2224-5R ^{oo}	434	341	69	21	79	0	R	8	0	0	0	0	0	0
NDT1068-11R ^{oo}	473	401	81	7	91	1	O-R	8	7	3	0	0	0	0
Waller-Duncan														
LSD (0.05)	(85)	(83)												

Planting date: 4/16/92, Fertilizer rate: 180-360-180 plus 37lbs N/A sidedressed, Vine killed: 8/29/92, Harvested: 10/13/92

* White and red-skinned clones: 1 = < 2", 2 = 2 to 4", 3 = > 4"; Russet clones: 1 = < 4, 2 = 4 to 16, 3 = > 16 oz.

** See rating system outlined in the text.

^o = Russet, ^{oo} = red

Long Island Table 7. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for Yukon Gold and Spartan Pearl grown at Riverhead, N.Y. - 1992.

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution			Specific Gravity
		cwt/A	percentage of standard	< 2"	2 to 2.5"			2 to 4 in.	2 to 4 in.	2.5 to 4 in.		
					2 to 2.5"	2.5 to 3.25"	3.25 to 4"					
Season-147 days												
Yukon Gold	430	378	100	11	9	67	12	1	88	79	77	
Spartan Pearl	539	452	120	15	12	63	9	1	84	72	77	
Waller-Duncan												
LSD (0.05)	(41)	(29)										

Planting date: 4/7/92, Fertilizer rate: 100-200-200 plus 60 lbs N/A, Vine killed: 9/1/92, Harvested: 9/14/92

Long Island Table 8. Maturity, tuber shape, and internal and external defects, for Yukon Gold and Spartan Pearl grown at Riverhead, N.Y. - 1992.

Clone	Maturity on 8/25/92	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Sun-		Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.		
				Total	burn								
Season-147 days													
Yukon Gold	2	R - O	6	4	3	2	0	0	30	0	3	0	0
Spartan Pearl	3	R	6	7	1	0	1	4	5	5	0	0	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 9. Yield, marketable yield, percentage of yield by grade, size distribution, and specific gravity for red-skinned clones grown at Riverhead, N.Y. - 1992

Red-skinned clones grown at Riverhead, N. Y. - 1952											
Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution		Specific Gravity
		cwt/A	percentage of standard	< 2"	2 to 2.5"		2.5 to 3.25"		2 to 4 in.	2.5 to 4 in.	
					2.5"	3.25"	4"	> 4"			
Season-146 days											
Chieftain	555	473	100	15	24	60	2	0	85	61	66
Norland	375	300	63	20	36	44	0	0	80	44	58
D191-103DR	385	264	55	32	21	47	0	0	68	47	57
Purple 5	410	349	74	15	27	58	0	0	85	58	68
B0616-1	447	370	78	17	16	63	3	0	83	66	67
LA12-59	519	444	94	13	11	68	6	1	85	74	76
ND2224-5R	416	348	73	16	35	48	1	0	84	49	57
NDT9-1068-11R	561	459	97	17	12	60	10	1	82	70	60
Waller-Duncan											
LSD (0.05)	(63)	(62)									(3)

Planted: 4/8/92, Fertilizer rate: 100-200-200 /A plus 60 lb N/A sidedressed, Vine killed: 9/1/92, Harvested: 9/21/92.

Long Island Table 10. Maturity, tuber shape, and internal and external defects for red-skinned clones grown at Riverhead, N. Y. - 1992

Rivencourt, N. I. - 1992											
Clone	Maturity on 8/3/92	Tuber Data*		Tuber Defects (%)					Percentage		
		Shape	Appearance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.
Season-146 days											
Chieftain	6	O - R	7	3	2	0	0	0	0	3	0
Norland	2	O - R	6	2	1	1	1	0	0	5	3
D191-103DR	5	R	5	19	2	2	1	15	0	0	0
Purple 5	4	O	8	2	2	0	0	0	3	0	0
B0616-1	5	R	6	9	2	1	3	2	0	0	0
LA12-59	6	R	6	8	2	1	4	1	0	0	0
ND2224-5R	3	R	9	3	2	1	0	0	0	0	3
NDT9-1068-11R	7	O - R	6	13	6	1	5	1	3	3	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 11. Yield, marketable yield, percentage of yield by grade, size distribution and specific gravity for russet-skinned clones grown at Riverhead, N.Y. - 1992

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution (%)					Size Distribution		Specific Gravity	
		cwt/A	percentage of standard	< 4	8	12	16	>16 oz.	4 to 16 oz.	8 to 16 oz.		
Season-146 days												
BelRus	441	307	100	29	36	19	15	1	70	34	76	
Eide Russet	493	350	114	29	47	19	4	0	71	24	74	
HiLite Russet	414	326	107	19	39	31	9	2	79	40	69	
R. Burbank	544	369	121	29	32	27	9	3	68	36	78	
R. Norkotah	381	248	81	33	36	21	7	2	65	29	69	
B0186-1	471	318	104	28	40	22	5	5	67	28	79	
B0306-6	457	327	107	27	43	22	7	1	71	28	74	
B0311-2	447	285	93	33	37	22	5	3	64	27	78	
B0329-1	429	276	90	35	41	20	4	0	64	23	74	
B9922-11(N)	441	352	115	17	41	28	11	3	80	39	83	
B9922-11(U)	411	320	104	19	48	26	4	3	78	30	83	
ND1538-1RUS	529	381	124	24	31	30	11	4	72	41	71	
W1005RUS	542	425	139	21	48	27	3	1	78	30	86	

Waller-Duncan												
LSD (0.05)		(103)	(88)									(3)

Planted: 4/8/92, Fertilizer rate: 100-200-200 /A plus 60 lb N/A sidedressed, Vine killed: 9/1/92, Harvested: 9/21/92.

Long Island Table 12. Maturity, tuber shape, and internal and external defects for russet-skinned clones grown at Riverhead, N. Y. - 1992

Clone	Maturity on 8/3/92*	Tuber Data*		Tuber Defects (%)					Percentage				
		Shape	Appear- ance	Total	Sun- burn	Mis- shapen	Growth cracks	Other**	Hollow heart	Brown center	Internal Necrosis Sl. Mod. Sev.		
Season-146 days													
BelRus	5	L	7	9	8	1	0	1	20	0	0	0	0
Eide Russet	7	L	6	5	4	0	0	0	0	0	3	0	0
HiLite Russet	4	L	7	3	2	0	0	0	8	0	0	0	0
R. Burbank	8	L	4	16	1	14	0	1	28	0	0	0	0
R. Norkotah	4	L	6	7	4	2	0	1	10	0	5	0	0
B0186-1	7	L-O	7	13	2	0	10	0	23	0	10	18	3
B0306-6	4	L	7	3	3	0	0	0	0	8	0	0	0
B0311-2	5	L	6	14	7	4	1	2	3	0	3	3	3
B0329-1	5	L	7	11	5	5	1	0	13	0	0	0	0
B9922-11(N)	7	O-L	7	8	3	5	1	0	35	0	0	0	0
B9922-11(U)	7	O-L	7	10	3	5	2	0	15	0	0	0	0
ND1538-1RUS	6	L	6	9	3	5	1	1	8	0	0	0	0
W1005RUS	8	L	7	5	4	1	0	0	5	0	0	3	0

* See rating system outlined in the text.

** Other includes defects such as rhizoctonia, prominent lenticels, pink eye, decay and other defects scorable against a U.S. No. 1 grade. Mechanical defects, however, were not scored.

Long Island Table 13. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial, 1992

Clone	Yield (cwt/A)		% standard 2 to 4"	% Defects	Specific Gravity	% Internal Defects						Color	Texture	Shape	Depth	Eye Depth		Appearance	Comments
	Total	2 to 4"				HH	BC	Internal Necrosis								Lateral	Apical		
								SI	M	S									
White-skinned lines																			
Superior	554	457	100	6	73	20	0	0	0	0	Bu	SN	O-R	MT	MD	MD	5		
AF1506-2	390	293	64	13	69	0	0	0	0	0	Bu	SN	O-L	SF	S	S	7		
AF1513-1	562	405	89	7	67	0	0	0	0	0	W	S	L-O	MT	S	S	6	Long Type	
AF1527-3	493	389	85	13	74	70	0	0	0	0	Bu	SN	R-O	R	S	S	7	GC	
AF1556-5	421	261	57	27	72	0	0	0	0	0	W	S	O	MT	S	S	8	GC	
AF1556-6	511	429	94	7	67	0	0	0	0	0	Bu	SN	O	MT	S	S	8	OK	
AF1568-9	485	393	86	8	68	10	0	0	0	0	Bu	SN	R-O	SF	MS	MS	6		
AF1569-3	516	378	83	13	73	0	0	0	0	0	Bu	SN	O	MT	S	S	8		
AF1572-1	591	423	93	16	66	30	0	0	0	0	Bu	SN	O-R	MT	S	S	6	Some Sp	
B0176-24	713	609	133	10	83	20	0	0	0	0	Bu	SN	R-O	MT	S	MS	7		
B0178-30	629	538	118	5	86	20	50	0	20	0	W	RS	R	MT	S	MD	6		
B0246-6	532	489	107	2	73	0	0	0	0	0	Bu	RS	O-R	SF	S	MD	7		
B0564-12	441	372	81	5	75	10	10	0	0	0	Bu	SN	R-O	MT	S	S	7	DSE	
B0564-9	619	520	114	6	74	30	0	0	0	0	Bu	SN	R	SF	S	MD	6	Irr	
B0602-1	534	452	99	9	68	10	10	10	0	0	Bu	SN	R	R	S	MD	7		
B0608-5	576	507	111	5	71	0	10	10	0	0	Bu	SN	O	SF	S	S	7	Some Kn	
B0610-2	535	454	99	4	83	0	10	20	0	0	Bu	SN	R	R	S	S	8		
B0622-2	532	447	98	8	76	30	70	10	0	0	W	S	R	R	MS	MD	6	Irr	
B0674-9	528	474	104	3	68	0	20	20	0	0	Bu	RS	R	MT	S	MD	6		
B0682-6	719	580	127	5	79	20	0	10	0	0	Bu	SN	O	F	S	D	5	L, Irr	
B0684-1Y	458	428	94	1	74	0	0	0	0	0	W	RS	O	SF	MD	MD	6	W, Not Y	
B0760-15	570	502	110	5	76	10	0	10	0	0	Bu	RS	O-R	MT	S	MD	5		
B0761-6	533	441	96	9	80	0	60	10	0	0	Bu	SN	R-O	SF	S	MD	5	Irr, severe HH	
B0850-8	391	343	75	3	62	0	0	0	0	0	Bu	S	R-O	MT	S	S	6		
B0856-4	595	463	101	13	69	0	0	0	0	0	W	S	R	MT	S	MD	5	RLN, Sc	
B0871-6	403	333	73	10	80	10	0	0	0	0	W	S	O	MT	S	S	8	Some Kn	
B0884-9	542	495	108	2	68	0	0	0	0	0	Bu	RS	R	R	S	MD	7		
B0902-5	412	347	76	6	82	20	0	0	0	0	Bu	RS	R	MT	S	MD	6	DSE	
B0906-1	542	460	101	7	82	0	0	0	0	0	Bu	SN	R	R	S	MD	6		
B0918-14	498	434	95	7	73	10	0	0	0	0	W	S	R	R	S	MS	7	Flesh BW	
B0925-1	405	350	76	1	80	0	10	0	0	0	B	S	R-O	R	S	S	7	PE, Lt Y	
K6-70B	502	430	94	8	69	30	40	0	0	0	Bu	SN	R-O	MT	MD	MD	7		

Long Island Table 13 cont. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial. 1992

Clone	Yield (cwt/A)		% of standard 2 to 4"	% Defects 2 to 4"	% Specific Gravity	% Internal Defects							Color	Texture	Shape	Depth	Eye Depth		Appear-ance	Comments
	Total	2 to 4"				HH	BC	Internal Necrosis			S									
								SI	M	S		Lateral					Apical			
White-skinned lines																				
Superior	554	457	100	6	73	20	0	0	0	0	Bu	SN	O-R	MT	MD	MD	5			
K6-155	598	450	98	15	66	40	10	0	0	0	Bu	SN	O	SF	S	MS	5	Pear, Irr		
K7-1	688	557	122	6	64	40	10	0	0	0	Bu	SN	R	SF	S	MS	7	Lt Y		
K7-2	651	523	114	7	67	20	0	10	0	0	Bu	SN	R-O	MT	S	MD	7	Lt Y,2VD		
K7-6	558	452	99	11	62	0	0	20	0	0	Bu	SN	O-R	MT	S	MD	6	Lt Y		
K7-18	588	455	100	16	73	0	0	0	0	0	Bu	SN	R-O	MT	S	MS	7	Lt Y		
K8-4	602	439	96	9	70	0	0	10	20	0	W	RS	O-L	F	S	S	8	Long		
K88-24(1)	757	614	134	10	71	0	0	0	30	0	W	RS	O-R	MT	MS	MS	7	Sp,3BS		
K88-30	528	380	83	12	69	0	0	0	0	0	W	S	R	F	S	S	7	L!		
K9-5	612	519	113	5	66	0	20	0	0	0	Bu	SN	R	R	S	MS	6			
L2-9	643	538	118	3	74	0	0	0	0	0	W	S	O	F	S	MD	7	L		
L7-1	645	549	120	6	79	30	0	0	0	0	Bu	SN	O	SF	MS	MD	7			
L8-9	546	406	89	6	68	0	0	10	0	0	Bu	SN	R-O	MT	S	S	8			
L8-18	629	498	109	10	66	0	10	10	0	0	W	RS	O	SF	S	S	7	PE		
L10-4	651	503	110	6	84	30	0	0	0	0	Bu	SN	R	MT	S	MS	7			
L14-1	493	418	91	5	67	0	0	20	10	0	W	S	R-O	R	S	MS	7	Lt Y/Bruised/ VD		
L16-2	578	513	112	8	80	90	0	10	0	0	Bu	SN	R-O	MT	MD	MD	6	Some Long		
L18-4	529	477	104	2	76	10	0	0	10	0	Bu	SN	O	F	S	MS	7			
L18-12	481	360	79	2	73	0	0	0	0	0	W	S	O	MT	S	S	8			
L51-1	630	533	117	6	78	0	0	0	0	0	Bu	RS	R-O	MT	MS	MS	7			
L53-10	686	533	117	10	75	0	0	0	0	0	Bu	SN	O	SF	S	MS	7			
L60-7	535	411	90	11	76	50	10	0	0	0	T	N	R	R	MS	MD	4			
L60-9	619	533	117	5	74	10	0	0	0	0	W	S	R	R	S	MD	7	DSE		
L61-2	646	485	106	8	65	0	0	0	0	0	BW	S	R	R	S	MS	8			
L61-6	431	363	79	5	76	0	0	0	0	0	W	S	R	R	S	S	8			
White skinned lines with poor yield and/or appearance																				
AF1513-2	B0174-16	B0585-6				B0836-8	B0874-13	B0954-2					L2-12		L18-11		L61-5			
AF1556-3	B0177-20	B0586-3				B0868-3	B0879-4	K8-7					L7-5		L53-4		L16-1			
AF1566-10	B0180-24Y	B0613-2				B0868-6	B0906-13	K9-16					L8-16		L53-7		L16-3			
AF1568-11	B0245-15	B0684-5				B0869-14	B0911-10Y	K9-29					L10-3		L53-11					
AF1570-1	B0566-5	B0720-4				B0870-5	B0925-4Y	K88-29					L18-8		L55-1					
	B0585-5	B0735-9				B0873-5	B0933-8	L2-6					L18-9		L60-2					

Long Island Table 13 cont. Yield and quality of early selection lines and recently named varieties in a non-replicated observation trial. 1992

Clone	Yield (cwt/A)		% of standard 2 to 4"	% Defects		Specific Gravity	% Internal Defects								Color	Texture	Shape	Depth	Eye Depth		Appearance	Comments
	Total	2 to 4"		HH	BC		Sl.	M	S	Internal Necrosis		Lateral	Apical									
										%	%											
Russet-skinned lines																						
Coastal Rus.	441	354	100	6	68	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	8	
AF1552-5	590	320	90	23	84	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
B0169-56	505	378	107	10	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
B0338-2	364	255	72	16	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
B0647-1(1)	435	340	96	10	58	60	0	20	10	10	0	0	0	0	0	0	0	0	0	0	7	
B0647-1(2)	423	280	79	14	63	80	0	20	20	0	0	0	0	0	0	0	0	0	0	0	5	
B0835-11	411	316	89	6	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
B0863-9	547	391	110	10	69	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	6	
B0880-15	523	416	118	6	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
B0956-4	413	378	107	3	63	0	60	10	10	0	0	0	0	0	0	0	0	0	0	0	6	
Red-skinned lines																						
Chieftain	343	248	100	17	64	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	7	
AF1515-1	328	238	96	9	63	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
B0800-12Y	372	257	104	6	65	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	6	
B0806-13Y	448	342	138	6	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
B0808-3Y	429	283	114	12	71	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
B0811-2	417	257	104	6	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
B0850-4	327	238	96	6	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
B0850-5	297	210	85	3	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
B0852-5	476	403	163	2	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
B0852-7	330	247	100	10	74	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
B0899-5	279	232	94	4	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
B0903-2	584	465	188	13	67	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
B0918-5	533	508	144	0	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
B0921-2	292	206	83	4	64	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	6	
M252-1	715	473	191	21	63	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
Russet-skinned lines with poor yield and/or appearance: B0316-19, B0348-2, B0649-5, B0742-1, B0745-14, B0863-2, B0915-3, B0950-6																						
Red- & purple-skinned lines with poor yield and/or appearance: B0899-8, B0921-13																						

Superior was replicated six times, Coastal Russet was replicated three times and Chieftain was replicated twice. All other entries were not replicated unless followed by () , which has the replicate included within.

Long Island Table 14. The effect of spacing and seed size on yield, size distribution, mean tuber weight, tubers per foot and external and internal defects of 'Norwis' grown at Riverhead, N.Y. - 1992.

Seed spacing (inch)	Seed size (oz.)	Total	Yield (cwt/A)					Mean		Tubers per Foot	Percentage				
			2-4"	< 2"	2 to 2.5"		3.25 to 4"	> 4" Defects	Tuber Wt. (oz)		Hollow Internal Necrosis				
					2 to 2.5"	3.25"					heart	Sl.	Mod. Sev.		
Season - 153 days.															
8	1.0	563	496	20	30	205	261	27	20	7.8	7.5	10	10	3	3
	1.5	574	524	18	47	217	260	12	20	7.7	7.8	10	13	3	0
	2.0	569	518	25	49	256	212	12	15	7.0	8.5	5	10	5	0
	2.5	555	505	31	62	261	182	6	13	6.4	9.2	8	3	5	0
12	1.0	496	396	10	19	125	251	54	35	9.0	5.7	8	3	0	0
	1.5	556	493	11	30	178	286	20	31	8.6	6.7	5	5	0	0
	2.0	580	522	15	37	198	287	20	23	7.7	7.9	10	13	0	0
	2.5	543	471	25	39	177	255	11	36	7.4	7.6	10	5	5	0
MAIN EFFECTS															
Spacing															
8"		565a	511a	24a	47a	235b	229a	14a		7.2a	8.3b				
12"		544a	471a	16a	31a	170a	270a	26a		8.2a	7.0a				
Seed Size															
1.0		529a	446a	15a	24a	165a	256b	41b		8.4b	6.6a				
1.5		565b	509bc	15a	39b	198b	273b	16a		8.2b	7.2a				
2.0		574b	520c	20a	43bc	227c	250ab	16a		7.4a	8.2b				
2.5		549ab	488bc	28b	50c	219bc	218a	9a		6.9a	8.4b				

Means followed by the same letter in each main effect are not significantly different from each other according to Fisher's Protected LSD (0.05).

Long Island Table 15. The effect of nitrogen rate on 'Norwis' yield, marketable yield, percent size distribution, specific gravity, appearance, internal and external defects. Riverhead, N. Y. - 1992.

Sidedress nitrogen (lb/A)	Total Marketable Yield		Size Distribution		Specific Gravity	Appearance	Percentage		
	Yield cwt/A	percentage of standard	2 to 4 in.	2.5 to 4 in.			Tuber defects	Hollow heart	Brown center
0	508	449	100	88	75	6	4	25	10
60	581	504	112	87	78	5	5	13	10
120	610	542	121	89	83	5	3	8	10
<i>Fishers Protected</i>									
<i>LSD (0.05)</i>									
	(23)	(40)					(3)		

Planted: 4/9/92, Fertilizer rate at planting; 100-200-200, Sidedressed at treatment rates on 5/26/92,
Vine Killed : 9/9/92, Harvested: 9/24/92.

Long Island Table 16. The effect of planting date on 'Norwis' yield, marketable yield, percent size distribution, specific gravity, appearance and internal and external defects. Riverhead, N. Y. - 1992.

Planting date	Total Marketable Yield		Size Distribution		Specific Gravity	Appearance	Percentage		
	Yield cwt/A	percentage of standard	2 to 4 in.	2.5 to 4 in.			Tuber defects	Hollow heart	Brown center
4/9/92	546	476	100	87	80	5	6	10	10
5/5/92	547	483	101	88	81	5	5	3	18
6/3/92	444	385	81	87	67	4	5	13	3
<i>Fishers Protected</i>									
<i>LSD (0.05)</i>									
	(90)	(81)					(5)		

Planted: 4/9/92, Fertilizer rate: 100-200-200 at planting, 60 lbs N/A sidedressed, Vine Killed : 9/9/92, Harvested: 9/24/92.

Long Island Table 17. After-cooking darkening and blackspot ratings of clones grown in 1991.

Main Season White			NE 107 White			Russet			Red		
1991 Tables 4-5			1991 Tables 6-7			1991 Tables 10-11			1991 Tables 12-13		
Clone	ACD	BS	Clone	ACD	BS	Clone	ACD	BS	Clone	ACD	BS
Katahdin	4.5	5.9	Katahdin	4.6	6.0	BeIRus	4.9	5.9	Chieftain	4.9	5.9
Superior	4.5	5.8	Allegany	4.6	5.9	Russet Burbank	4.9	5.9	Norland	4.5	6.0
Allegany	4.6	5.9	Atlantic	4.4	6.0	B0316-19	4.5	5.8	B0033-23	4.8	5.8
Castile	4.9	6.0	Kennebec	4.9	6.0	B0473-6	4.2	5.5	B0616-1	5.2	5.9
Hampton	4.8	6.0	AF0828-5	4.8	6.0	B9922-11	4.5	5.9	ND2224-5R	4.7	5.9
Hudson	4.4	5.9	AF1060-2	4.5	5.9	ND671-4	4.6	6.0	NDT9-1068-11R	5.0	5.8
Norwis	4.9	5.9	B0178-34	3.4	5.8	W1005Rus	4.6	5.7			
B0174-11	4.2	5.8	NY78	4.4	6.0						
B0174-16	4.4	5.9	NY84	4.5	6.0						
B0234-8	4.7	5.5	NYE11-45	4.2	6.0						
B0610-2	4.6	6.0	NYE55-35	4.3	6.0						
NY86	4.5	6.0	NYE57-13	4.5	6.0						
NY87	4.4	5.9									
NY88	4.8	6.0									
NYK255-6	4.3	5.9									

Fishers Protected

LSD (0.05)	(0.3)	(0.1)	(0.4)	(0.1)	(0.3)	(0.3)	(0.4)	(0.1)
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After-cooking darkening (ACD) rating based on a scale of 1 to 5; 1 = severe darkening, 5 = no after-cooking darkening. Five tubers rated per replication, four replications in each experiment.

Blackspot (BS) determinations are based on approximately ten tubers per replication. Tubers were stored at 40 F and bruised between 2/4/92 and 2/11/92. Bruised areas were peeled and evaluated two days after impact. Each tuber received a blow in each of two locations about 1 to 2 cm from the stem end. The bruising was done by dropping a 100 gram weight a distance of 30 cm. The point of impact was marked by inking the base of the weight. Ratings are based on a scale of 1 to 6 with 1 = severe discoloration and 6 = no discoloration.

New York

R.L. Plaisted, B.B. Brodie, D.E. Halseth, S.S. Slack and W.M. Tingey

Early Generations

The crossing program produced 30 round-white combinations with chipping and tablestock potential, 3 red combinations, 123 trichome hybrids, and 13 Pratylenchus penetrans resistant hybrids.

Seeds produced in 1990 (Q's) were transplanted to six inch pots and four tubers saved from each. There were 10,081 round-white clones, 1100 Pratylenchus resistant clones, 2705 dark red selections, and 7603 trichome selections. In the latter two types of progenies, selection was based on skin color.

The seedling hill population (P's) produced 6250 four cut tuber selections. After a month of storage at 48F, these were tested for chip color with test tape and 3601 saved. The four hill plots (N's and P's) produced 2368 round white and 129 red hill selections. These were chipped from 45F and tested for resistance to the golden nematode. From these 925 were saved. The neotuberosum four hill plots produced 81 selections which were tested for resistance to PVX and PVY. From these 53 were saved.

The second year plots (M's and N's) were planted as 24 hill plots. These were selected on the basis of tuber appearance, specific gravity, chip color from 45F storage, and resistance to the golden nematode. To date 59 have survived for further evaluation.

Intermediate Generations

The third generation (L's) were grown in yield trials, the scab plot, and a seed plot. Based on yield, appearance, specific gravity and chipping performance, nine have survived for continued evaluation. The fourth generation was subjected a second year to the same tests as were applied to the previous generation. From these, nine round whites (K's) and four red clones (L's and M's) have survived.

Advanced Generations

A summary of the performance of the most advanced clones is as follows:

NY78 = A9-38 = M348-45 x Katahdin (1977). Late season tablestock. Attractive shape, bright skin, and scab resistance like that of Monona. Yield at Ellis Hollow and Mt. Pleasant over four seasons in cwt/A: NY78=369, Monona=326, Atlantic=430. Few pickouts and internal defects. Specific gravity like Monona. Boils white and does not slough. Does not chip. Tubers tend to hang to vines at harvest if still green. Reports of uneven stands in some farm scale demonstrations. Average vine vigor. Dormancy one week less than Katahdin. Resistant to golden nematode, early blight and scab. To be named Genesee.

NY79 = A73-1 = S377-10 x Elba(1977).
Early tablestock. May make acceptable chips from field. Early yields equal to Superior. Full season yields like Monona. Large tuber size. Round shape. Low specific gravity. Scurfy skin. Very good scab resistance. Resistant to the golden nematode. 27 acres of foundation seed. Current interest is largely on North Fork of Long Island.

NY84 = D146-11 = Rosa x NY66(1980).
Midseason tablestock. High yielding and scab resistant. Yield at Ellis Hollow and Mt. Pleasant over three seasons in cwt/A: NY84=460, Monona=349, Atlantic=452. Bright skin. Nice shape, slightly flat. Large tuber size. Early emerging, attractive vigorous vine. Early sizing. In three seasons, yields on August 1 same as Superior. In 1992, full season yields at 6" spacing were 50 cwt greater than 9" spacing. Few pickouts and internal defects. Specific gravity like Monona. Good cooking qualities, slight yellowish cast when boiled. Slight sloughing. Tuber dormancy two weeks longer than Katahdin or Atlantic. Resistant to golden nematode and very good scab resistance, nearly that of Superior.

NYE11-45 = Rosa x Q155-3(1981).
Midseason to late season chipstock and tablestock. High yields. Yield at Ellis Hollow and Mt. Pleasant over four seasons in cwt/A: E11-45 = 470, Monona=326, Atlantic=430. 122% of Monona in 5 years in Steuben County and 110% of Monona in 3 years in Wyoming County. Bright white skin. Attractive shape, somewhat flattened. Generally few internal defects and pickouts. Specific gravity and dormancy like Monona. Acceptable boiling qualities. Chip color equal to Atlantic from the field and equal to or better than Monona from storage at 48°, 45°, and also when reconditioned from 40°. Resistant to the golden nematode. Scab resistance like Monona.

NYE55-35 = Allegany x Atlantic (1981),
Mid-late season chipstock with high specific gravity and very good scab resistance. Yield of U.S. #1 in 4 years on Mt. Pleasant and Ellis Hollow in cwt/A = E55-35=371, Monona = 317, Atlantic = 370. Tends to have about 40% in the 1 7/8" - 2 1/2" size. 12" spacing improves size without hurting yield. Generally free of pickouts and internal defects, but may be subject to net necrosis. Attractive tuber shape. Netted skin, free of blemishes. Specific gravity equal to Atlantic. Chip color similar to Monona from 48° and 45° storage, some possibility of reconditioning from 40°. Good early vine growth, medium vigor at end of season, but better than Monona. Resistant to golden nematode and very resistant to scab, comparable to Superior.

NYE55-44-Allegany x Atlantic (1981).

Early to midseason table and chipstock. Very rapid emergence and early set. In five trials in Ellis Hollow during the past four years, E55-44 has produced 290 cwt/A in early August and Superior 280 cwt/A. At full season on Mr. Pleasant and Ellis Hollow for four seasons, E55-44 has produced 362 cwt/A compared to 326 for Monona and 430 for Atlantic. Attractive tuber shape. Skin texture like Superior. Large tuber size. Yields and tuber size improve at 7" spacing. Small percentage of pickouts and internal defects. Specific gravity about midway between Monona and Atlantic. Excellent chip color from the field under a range of environments, from 48° and 45° storage and from 40° with reconditioning. Good boiling and baking properties. Tuber dormancy like Katahdin or Atlantic. Exceptionally rapid early growth, but vines tend to decline in mid August, may be sensitive to air pollution. Scab reaction like Atlantic. Resistant to golden nematode and possibly to powdery scab.

NY87 = F24-12 = Monona x Allegany

(1982). Mid-late season chip and tablestock. High yields, early sizing, and large tuber size. Yield at Mt. Pleasant and Ellis Hollow over 4 seasons in cwt/A: NY87=448, Monona=317, Atlantic=367. Was not widely tested in 1992 because of PLRV in seed. Early sizing, about 93% of yield of Superior in early August. Very few pickouts. Few internal defects in 1992, but some hollow heart in prior years. Good tuber shape and bright skin. Specific gravity slightly better than Monona. Good chip color from the field and 48° and 45° storage. Two weeks longer dormancy than Katahdin and Atlantic. Nice vine type with large leaflets. Good boiling quality. Resistant to golden nematode and scab resistance like Monona.

NY94=J84-8 Allegany x Atlantic (1985).

Midseason, chipstock. High yields in 1991. Early season yields close to Superior. Late season crop not harvested in 1992 due to frequent growth cracks. Same defect in 1991. Good vine type. Good chip color from 48°, but inconsistent from 45°, and not good from 40°. Long tuber dormancy and good scab resistance. Specific gravity midway between Monona and Atlantic. Golden nematode resistant.

NY95=J84-16=Allegany x Atlantic

(1985). Midseason chipstock. Yield was 110% of Monona and 82% of Atlantic in 2 seasons on Mt. Pleasant and Ellis Hollow. Less than Monona in Steuben and Wyoming counties in 1992. Very few pickouts and internal defects. Tubers are bright, oblong shape, slightly flat, and tend to be small in size. Vigorous early growth. Nice large vines. Chip color is better than Monona at 48°, 45°, and reconditioned from 40° in 91-92. Specific gravity is .001 greater than Atlantic (6 trials, 3 years). Long tuber dormancy. Very good scab resistance. Golden nematode resistant.

NY96=D191-103DR=T31-67xT66-4(1980).

Early-midseason dark red tablestock. Two season yield in Ellis Hollow: 95% of Chieftain. Two season yield on August 1: 97% of Superior. Very attractive round shape, some netting on surface of tubers. Free of pickouts and internal defects. Low specific gravity. Good scab resistance. Golden nematode resistant.

New York - Upstate
D.E. Halseth, W.L. Hymes
R.W. Porter, R.L. MacLaury

Program Scope:

Potato variety yield trials were conducted in six counties in upstate New York in 1992 in which a total of 20 named and 78 numbered clones were evaluated. Six replicated trials were conducted at the Thompson Vegetable Research Farm at Freeville in Tompkins County on a Howard gravelly loam soil. Grower trials were conducted on mineral soils near Arkport (Steuben County), Cato (Cayuga County) and Hermitage (Wyoming County) and on muck soils near Fulton (Oswego County) and Savannah (Wayne County). Trials at Freeville were irrigated once, at the end of June before the rains began. All trials were grown using standard commercial cultural practices. As evaluation of potato lines with golden nematode (GN) resistance is of high priority, 20% of the named and 64% of the numbered entries in these trials have GN resistance. Marketable yield, tuber quality and appearance, maturity, storage life and processing potential are among the important characteristics which are evaluated.

Research Farm Results:

The early maturity yield trial had two clones, CF7523-1 and NYE57-13, which outyielded Superior. Both clones were later than the standard and also had much higher tuber

counts and heavier average tuber weight. The medium maturity trial had AC Novachip, NY84, NY87, and NYE11-45 outyielding Monona, while Mainechip and NY95 had specific gravity approaching Atlantic. In the medium-late trial AF828-5, AF1060-2, Norwis and Snowden outperformed Atlantic and Monona in yield. Snowden was the only entry to have dry matter equal to Atlantic. MN12823 was the only entry in the late trial to out-yield Atlantic, Katahdin and Monona. B0178-34 had dry matter equal to Atlantic while NY78 had by far the best appearance. In the USDA trial, B0256-1, B0676-7, B0682-2 and B0723-7 had good yields while B0174-16, B0256-1 and B0682-2 had dry matter almost as high as Atlantic. While Russet Burbank did very well in our wet year in the russet trial, B0186-1, Eide Russet and ND1538-1 had higher marketable yields.

County Trial Results:

It was a very wet growing season, with the Fulton and Savannah trials being nearly under water for several periods of time. Given this wet situation, most of the red skinned entries at both of these locations had severe silver scurf, black dot and/or Rhizoctonia skin defects. Redsen was the only clone with a bright red color, but it had poor yields. Red clones with

reasonable color were B0616-1, B0899-5, B0985-7, L33-1 and LA12-59, but Chieftain had by far the best red yield. The tablestock trial on sandy soils near Cato also was quite wet, but the 50 entries managed to average 338 cwt/acre total yield. NY101 (K7-1) was a very high yielding round white at 525 and 584 cwt/acre total yields at Cato and Fulton, respectively. GN chipping entries grown in the Steuben and Wyoming trials which yielded most consistently were Castile, Kanona, NYE11-45, and NYE55-35. Atlantic, Snowden, NY95, NYE55-35, and Mainechip had the highest average specific gravities for these two grower sites at 97, 96, 94, 93.5, and 90 respectively.

Table Heading Explanations:

Marketable yield in cwt/a was calculated from total yield less both external defects and undersize tubers (smaller than 1 7/8 inches).

Percent marketable yield represents the percentage that each entry's marketable yield is of that of a specified standard variety.

Size distribution percentage is the weight of a specific size category divided by total yield (including defects).

Specific gravity was taken by potato hydrometer.

Vine maturity ratings were on a nine point scale:

1 = all plants completely dead (very early maturity)

9 = all plants full green (very late maturity)

Tuber shape was classified using the code:

1 = round

2 = mostly round

3 = round to oblong

4 = mostly oblong

5 = oblong

6 = oblong to long

7 = mostly long

8 = long

9 = cylindrical

Tuber appearance was

subjectively evaluated using the scale:

1 = extremely rough or

otherwise unattractive

9 = very uniform and

attractive

External defects were rated on all material graded. Internal defects were made on a subset of tubers, usually 10 per replication, taken from size categories 3 and 4.

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Upstate New York Table 1. Yield, marketable yield, grade size distribution, mean tuber number per foot and weight, and specific gravity for the early maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.		
CF7523-1	361	330	6	18	64	12	0	94	76	7.2	5.2
Norchip	235	190	11	31	57	1	0	89	58	5.8	4.2
NY90	169	140	14	45	40	0	0	86	40	5.0	3.5
NY92	162	135	16	41	42	2	0	84	43	4.6	3.6
NY93	166	142	9	38	51	2	0	91	53	4.7	3.7
NYE55-44	167	144	12	42	42	4	0	88	46	5.0	3.5
NYE57-13	254	218	11	32	54	3	0	89	57	6.2	4.3
Superior (std)	182	162	9	32	54	5	0	91	59	4.9	3.9
Waller-Duncan LSD (k=100)	41	39								0.9	0.6
C.V. (%)	(12)	(14)								(10)	(9)
											(2)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 6

Vine-kill date (mowed): August 18

Harvest date: August 20

Upstate New York Table 2. Plant maturity, tuber shape and appearance, external and internal tuber defects for the early maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ¹		
				Sun-		Mis- shapen	Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
		Shape	Appear.	Total	burn						
CF7523-1	6.2	1.0	8.0	2.5	1.2	0.9	0.2	0.2	0.0	0.0	0.0
Norchip	5.7	1.0	6.0	8.7	3.0	2.9	2.3	0.6	0.0	0.0	0.0
NY90	1.4	1.0	6.8	2.6	0.9	0.0	1.7	0.0	0.0	0.0	0.0
NY92	1.7	2.0	6.3	0.4	0.2	0.0	0.0	0.2	3.3	0.0	0.0
NY93	2.2	1.0	6.0	5.2	0.6	0.0	4.7	0.0	2.5	0.0	0.0
NYE55-44	1.7	1.0	6.3	2.1	0.6	0.3	1.1	0.2	0.0	0.0	0.0
NYE57-13	5.8	2.0	6.7	3.1	1.7	0.4	1.0	0.0	10.0	0.0	0.0
Superior (std)	1.5	2.0	5.0	2.6	0.1	2.1	0.1	0.3	5.0	0.0	0.0

¹See the Table Heading Explanations section in the Upstate New York summary.

Upstate New York Table 3. Yield, marketable yield, grade size distribution, mean tuber number per foot and weight, and specific gravity for the medium maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.		
AC Novachip	339	283	7	16	64	12	1	93	76	6.2	5.7
Atlantic	242	203	6	19	70	5	0	94	75	5.0	5.0
Kennebec	370	237	5	11	60	19	6	89	79	6.1	6.4
MaineChip	218	181	11	37	50	3	0	89	52	5.5	4.1
MN13540	278	238	10	31	55	3	0	90	58	6.7	4.3
Monona (std)	284	261	4	17	67	12	1	96	79	5.5	5.4
NY84	354	298	7	21	64	7	1	92	71	7.5	4.9
NY85	199	167	11	42	47	0	0	89	47	5.5	3.8
NY87	316	298	5	18	72	6	0	95	78	6.6	5.0
NY94	231	157	6	23	63	9	0	94	72	4.9	4.9
NY95	237	189	13	29	52	5	0	87	57	5.5	4.5
NYE11-45	366	328	5	24	69	2	0	95	71	7.8	4.9
Waller-Duncan											
LSD (k=100)	60	60								0.7	0.7
C.V. (%)	(15)	(18)								(9)	(11)
										(2)	(2)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 7

Vine-kill date: August 26

Harvest date: September 9

Upstate New York Table 4. Plant maturity, tuber shape and appearance, external and internal tuber defects for the medium maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ¹		
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
AC Novachip Atlantic	6.1	4.0	5.3	9.1	4.6	1.4	1.5	1.7	0.0	2.5	2.5
	4.8	1.0	5.0	9.8	2.4	1.9	3.0	2.5	7.5	0.0	2.5
Kennebec MaineChip	5.6	5.0	3.6	25.5	9.4	9.1	5.3	1.8	17.5	2.5	2.5
	3.5	2.0	4.5	7.0	1.2	1.7	4.0	0.2	2.5	0.0	0.0
MN13540 Monona (std)	4.6	2.0	7.0	4.6	0.6	2.7	1.0	0.3	0.0	0.0	0.0
	5.0	2.0	5.3	4.0	0.7	1.3	1.3	0.7	22.5	2.5	0.0
NY84 NY85	4.6	2.0	6.6	8.1	2.8	2.6	2.5	0.2	2.5	0.0	0.0
	2.0	1.0	5.9	5.6	1.4	4.0	0.3	0.0	0.0	0.0	0.0
NY87 NY94	4.5	1.0	6.1	1.2	0.1	0.5	0.5	0.2	10.0	0.0	0.0
	3.6	1.0	5.9	26.2	1.6	0.2	22.4	1.9	2.5	0.0	0.0
NY95 NYE11-45	5.4	2.0	5.4	7.1	1.1	5.8	0.0	0.1	5.0	2.5	0.0
	6.3	1.8	6.5	5.7	2.4	2.1	0.5	0.7	5.0	0.0	0.0

¹See the Table Heading Explanations section in the Upstate New York summary.

Upstate New York Table 5. Yield, marketable yield, grade size distribution, mean tuber number per foot and weight, and specific gravity for the medium-late maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.	
				1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.			
Atlantic	306	268	99	6	18	62	14	1	94	75	6.2	5.1	95
AF828-5	406	345	127	3	11	56	28	3	94	83	6.3	6.8	77
AF1060-2	378	323	119	8	18	58	16	1	92	74	7.4	5.3	80
Monona (std)	322	272	100	4	13	62	19	3	94	81	5.6	6.0	73
Norwis	406	366	135	2	8	58	28	4	94	86	6.1	6.9	74
NY88	228	190	70	11	25	55	9	0	89	64	4.9	4.8	83
NY89	212	177	65	7	20	68	5	0	93	73	4.7	4.7	89
NY91	131	98	36	13	33	46	8	0	87	54	3.1	4.3	90
Snowden	336	295	108	8	31	55	6	0	92	61	8.1	4.3	95
Waller-Duncan LSD (k=100)	44	44									0.5	0.7	2
C.V. (%)	(11)	(13)									(7)	(9)	(2)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 7

Vine-kill date: August 26

Harvest date: September 9

Upstate New York Table 6. Plant maturity, tuber shape and appearance, external and internal tuber defects for the medium-late maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)					Int. Tuber Defects (%) ¹		
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
Atlantic	5.6	1.0	6.0	5.9	1.2	2.4	2.1	0.2	0.0	0.0	5.0
AF828-5	6.4	2.0	6.3	9.0	4.4	1.5	2.6	0.6	0.0	2.5	0.0
AF1060-2	5.4	1.0	6.6	6.8	1.7	1.9	3.0	0.2	0.0	2.5	0.0
Monona (std)	4.4	2.0	4.9	9.4	2.6	4.0	2.5	0.2	20.0	7.5	0.0
Norwis	5.5	2.0	5.8	4.4	1.2	1.7	1.3	0.2	10.0	7.5	7.5
NY88	2.5	1.0	6.5	5.2	2.5	1.1	1.6	0.0	0.0	2.5	2.5
NY89	5.0	2.0	5.5	9.5	4.1	2.3	2.8	0.4	17.5	2.5	0.0
NY91	4.4	1.0	6.0	12.1	0.9	1.8	7.3	2.1	5.0	0.0	0.0
Snowden	6.1	1.0	4.0	4.7	1.7	1.5	1.5	0.0	0.0	12.5	0.0

¹See the Table Heading Explanations section in the Upstate New York summary.

Upstate New York Table 7. Yield, marketable yield, grade size distribution, mean tuber number per foot and weight, and specific gravity for the late maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.
			1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.		
Allegany	333	269	3	13	56	22	6	91	78	5.3	6.6
Atlantic	219	182	7	24	63	7	0	93	70	4.7	4.8
B0175-20	295	217	2	7	52	29	11	87	80	3.9	7.9
B0178-34	246	223	6	20	70	5	0	94	75	5.3	4.8
Castile	317	268	6	24	63	7	1	94	70	6.2	5.3
Katahdin	340	281	3	12	67	17	1	96	84	5.6	6.3
MN12823	368	306	3	16	66	15	0	97	81	6.2	6.1
Monona (std)	259	238	2	12	74	11	2	96	84	4.7	5.8
NY78	295	233	3	12	57	24	4	92	81	4.9	6.3
Waller-Duncan LSD (k=100)	38	45								0.8	0.5
C.V. (%)	(9)	(13)								(11)	(6)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 7

Vine-kill date: August 26

Harvest date: September 14

Upstate New York Table 8. Plant maturity, tuber shape and appearance, external and internal tuber defects for the late maturity trial grown at Freeville, New York - 1992.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)				Int. Tuber Defects (%) ¹			
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
Allegany	6.8	2.0	6.9	10.8	3.5	3.9	3.4	0.0	0.0	2.5	0.0
Atlantic	4.0	1.0	5.3	10.3	2.2	1.8	4.7	1.6	2.5	2.5	5.0
B0175-20	6.4	3.0	4.8	14.0	4.6	3.7	5.2	0.5	5.0	2.5	22.5
B0178-34	5.0	2.0	6.0	3.9	0.4	0.7	1.9	0.9	5.0	5.0	0.0
Castile	5.8	4.0	6.3	9.3	2.1	6.9	0.4	0.0	5.0	5.0	0.0
Katahdin	6.6	2.0	6.9	13.1	10.6	0.4	1.9	0.2	15.0	0.0	0.0
MN12823	6.3	1.0	5.3	13.7	2.5	10.0	1.2	0.0	2.5	5.0	2.5
Monona (std)	3.6	1.0	5.1	4.3	0.7	1.5	1.7	0.3	5.0	5.0	0.0
NY78	6.3	1.0	7.9	13.1	7.2	1.3	3.9	0.6	5.0	2.5	0.0

¹See the Table Heading Explanations section in the Upstate New York summary.

Upstate New York Table 9. Yield, marketable yield, grade size distribution, mean tuber number per foot and weight, and specific gravity for the USDA trial grown at Freeville, New York - 1992.

Variety/Clone	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)		Mean Tuber #/ft wt(oz)	Spec. Grav.	
				1	2	3	4	5	1-7/8 to 4 in.	2-1/2 to 4 in.			
Atlantic (std)	256	225	100	5	22	65	7	1	94	72	5.6	4.8	97
B0174-16	231	198	88	9	23	64	4	0	91	68	5.2	4.6	96
B0180-24	268	199	88	16	39	43	3	0	84	45	7.4	3.8	70
B0246-6	198	171	76	7	30	57	5	1	92	62	4.7	4.4	77
B0256-1	292	260	116	7	14	67	12	0	93	80	5.4	5.6	94
B0257-9	171	145	64	5	16	61	18	0	95	79	3.4	5.3	88
B0586-3	192	159	71	10	28	56	6	0	90	62	4.6	4.4	88
B0587-9	178	155	69	8	34	58	0	0	92	58	4.6	4.0	76
B0602-1	264	201	89	15	31	49	5	0	85	54	6.7	4.1	77
B0610-2	256	205	91	17	34	48	0	0	83	49	6.8	3.9	86
B0676-7	250	229	102	4	19	65	11	2	95	76	5.1	5.1	72
B0682-2	302	264	117	6	16	56	21	0	94	78	5.6	5.6	95
B0720-1	208	172	76	6	19	59	15	2	92	73	4.1	5.2	85
B0723-7	348	275	122	3	9	47	33	8	89	80	5.1	7.1	81
B0728-5	169	141	63	5	28	63	3	0	95	66	3.9	4.5	81
Katahdin	386	289	129	5	15	61	15	4	91	76	7.1	5.6	78
Monona	290	263	117	4	15	68	13	1	96	81	5.5	5.5	74
Waller-Duncan LSD (k=100)	41	45									0.8	0.6	2
C.V. (%)	(13)	(16)							(11)	(10)			(2)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 8

Vine-kill date: August 26

Harvest date: September 2

Upstate New York Table 10. Plant maturity, tuber shape and appearance, tuber shape and appearance, external and internal tuber defects for the USDA trial grown at Freeville, New York - 1992.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)			Internal Tuber Defects (%) ¹		
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Int. Holl. Heart
Atlantic (std)	4.8	1.0	5.5	6.8	0.7	3.0	2.9	0.3	5.0
B0174-16	3.9	2.0	5.8	5.5	0.6	1.2	1.1	2.6	7.5
B0180-24	2.3	3.3	4.5	11.9	0.5	5.6	5.1	0.6	2.5
B0246-6	1.5	2.0	5.1	5.5	0.0	2.8	2.3	0.4	0.0
B0256-1	4.9	2.0	5.6	4.1	0.0	2.1	1.7	0.3	15.0
B0257-9	2.9	2.0	5.9	11.2	1.3	4.4	3.5	2.0	2.5
B0586-3	5.3	2.0	5.8	7.8	0.0	0.4	3.3	4.1	0.0
B0587-9	1.8	2.0	6.1	5.1	0.1	2.2	1.9	1.0	0.0
B0602-1	3.1	2.0	5.9	9.4	1.0	0.9	6.8	0.7	7.5
B0610-2	3.4	2.0	6.5	3.9	0.9	1.0	1.1	0.8	0.0
B0676-7	1.8	1.0	6.0	2.9	0.0	0.9	2.1	0.0	0.0
B0682-2	5.0	2.0	7.3	6.4	1.4	0.1	4.9	0.0	7.5
B0720-1	2.9	3.0	3.1	8.8	1.8	3.5	1.9	1.6	2.5
B0723-7	7.0	2.0	5.0	9.8	3.5	3.8	1.2	1.4	0.0
B0728-5	1.3	2.0	6.6	10.9	0.8	4.5	5.5	0.0	0.0
Katahdin	7.1	2.0	5.9	16.1	13.0	0.2	2.1	0.8	17.5
Monona	4.8	2.0	5.5	5.4	1.0	2.1	2.0	0.2	7.5

¹See the Table Heading Explanations section in the Upstate New York summary.

Upstate New York Table 11. Yield, marketable yield, grade size distribution, mean tuber number per foot and weight, and specific gravity for the russet-skinned trial grown at Freeville, New York - 1992.

Variety/Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. by Class ¹ (% of total yield)					Size Distrib. (%)			Mean Tuber #/ft	Tuber wt(oz)	Spec. Grav.	
			1	2	3	4	5	4 to 12 oz	over 8 oz	over 12 oz				
BelRus	263	142	62	42	41	16	1	0	57	17	1	6.2	4.4	83
B0186-1	373	254	112	17	47	25	8	2	72	36	10	6.4	6.1	83
B0311-2	349	158	70	31	35	23	9	3	58	35	12	6.6	5.5	85
B9922-11	362	221	98	21	44	26	7	2	70	34	8	6.4	5.9	86
Eide Russet	432	258	114	30	44	19	6	1	63	26	7	8.3	5.4	80
ND671-4	369	220	97	33	40	21	6	1	61	27	6	7.4	5.2	75
ND1538-1	405	248	109	25	43	22	7	4	64	32	11	7.4	5.7	76
Rus. Burbank (std)	460	227	100	20	29	28	14	9	57	51	23	7.5	6.4	86
Waller-Duncan LSD (k=100)	26	41										0.8	0.6	3
C.V. (%)	(6)	(13)										(8)	(7)	(3)

¹Size classes: 1 = 1-1/2 to 1-7/8"; 2 = 1-7/8 to 2-1/2"; 3 = 2-1/2 to 3-1/4"; 4 = 3-1/4 to 4"; 5 = over 4"

Plant date: May 13

Vine-kill date: September 8

Harvest date: September 17

Upstate New York Table 12. Plant maturity, tuber shape and appearance, external and internal tuber defects for the russet-skinned trial grown at Freeville, New York - 1992.

Variety/Clone	Plant ¹ Mat. at Vinekill	Tuber Data ¹		External Tuber Defects (%)				Int. Tuber Defects (%) ¹			
		Shape	Appear.	Total	Sun- burn	Mis- shapen	Growth Cracks	Rot	Holl. Heart	Vasc. Disc.	Int. Nec.
BelRus	5.1	6.1	7.4	3.9	2.7	0.8	0.3	0.2	5.0	0.0	0.0
B0186-1	5.3	4.0	6.4	12.2	4.0	2.9	5.0	0.3	2.5	0.0	0.0
B0311-2	4.8	5.5	6.0	20.6	9.2	5.6	4.6	1.2	2.5	0.0	0.0
B9922-11	6.9	5.5	5.9	15.5	2.8	6.2	6.4	0.0	5.0	2.5	0.0
Eide Russet	6.8	4.0	5.1	9.8	4.4	5.4	0.0	0.0	0.0	0.0	0.0
ND671-4	6.6	6.3	6.6	7.5	2.0	5.0	0.4	0.2	7.5	0.0	0.0
ND1538-1	5.5	5.0	5.6	9.8	1.4	7.2	1.1	0.0	0.0	0.0	0.0
Rus. Burbank (std)	7.8	7.4	4.0	21.6	4.6	16.2	0.5	0.2	2.5	0.0	0.0

¹See the Table Heading Explanations section in the Upstate New York summary.

Upstate New York Table 13. Yield, marketable yield, size distribution, mean tuber number per foot and weight, percentage defects, and specific gravity for the Cayuga County mineral soil variety trial grown at Cato, New York - 1992

Variety or Clone	Class	Total Yield cwt/A	Mkt. Yield cwt/A	% of std	Size Distrib. ¹ by Class			#/ft	Mean Tuber wt(oz)	Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.
					(% of tot. yld)													
					1	2	3			S	K	G	R	H	V	N		
Allegany	Whi	429	335	187	13	87	0	9.7	4.6	7	1	0	0	0	0	0	0	80
Atlantic	Whi	380	307	171	13	87	0	8.5	4.7	6	1	0	0	0	0	0	0	89
B0615-1	Red	360	282	157	14	86	0	9.2	4.1	2	5	0	1	0	0	10	0	64
B0616-1	Red	375	310	173	11	84	6	7.7	5.0	2	0	4	0	0	0	0	0	74
B0800-12	Red	319	249	139	20	80	0	8.4	4.0	0	0	1	1	0	0	0	0	70
B0806-13	Red	385	310	173	19	81	0	9.1	4.4	0	1	0	0	0	0	0	0	68
B0808-3	Red	352	206	115	38	62	0	12.0	3.0	0	1	2	0	10	20	0	0	74
B0808-4	Red	382	227	127	38	62	0	14.2	2.8	1	1	0	0	10	0	10	0	79
B0811-2	Red	383	251	140	28	72	0	9.4	4.2	2	5	0	0	0	0	0	0	77
B0811-13	Red	449	394	220	9	86	5	9.2	5.1	1	2	0	0	0	0	0	0	72
B0850-4	Red	291	194	109	26	74	0	8.1	3.7	0	6	0	0	0	0	0	0	69
B0899-5	Red	252	171	96	17	80	3	5.9	4.4	5	9	1	0	0	0	0	0	67
Castile	Whi	407	321	180	14	86	0	9.1	4.7	5	2	0	0	0	0	0	0	80
Chieftain	Red	438	344	192	16	81	4	7.1	6.4	1	5	0	0	0	0	15	0	67
CF7523-1	Whi	419	330	184	17	81	2	10.7	4.1	2	2	0	0	0	0	0	0	81
Kanona	Whi	337	256	143	8	90	2	6.0	5.8	16	0	0	0	0	0	0	0	74
Katahdin(std)	Whi	266	179	100	15	85	0	6.6	4.2	15	1	0	0	0	5	5	0	73
K6-70B	Whi	261	240	134	7	93	0	5.1	5.3	1	1	0	0	10	0	0	0	74
K6-155	Whi	384	305	171	13	87	0	8.2	4.9	7	0	0	0	0	0	20	0	78
K7-2	Whi	391	321	180	12	85	4	8.0	5.1	6	0	0	0	50	0	10	0	70

(Continued)

Upstate New York Table 13. - (Continued) - Yield, marketable yield, size distribution, mean tuber number per foot and weight, percentage defects, and specific gravity for the Cayuga County mineral soil variety trial grown at Cato, New York - 1992

Variety or Clone	Class	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std	Size Distrib. ¹ by Class (% of tot. yld)			Mean Tuber #/ft wt(oz)	Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.	
					1	2	3		S	K	G	R	H	V	N			
K7-6	Whi	437	370	207	9	89	2	9.0	5.0	1	0	4	0	0	0	0	0	69
K7-18	Whi	356	260	145	22	78	0	11.0	3.4	2	0	1	2	0	0	0	0	79
K8-4	Whi	395	307	171	17	83	0	8.1	5.1	6	0	0	0	0	20	0	0	75
K8-7	Whi	433	340	190	12	88	0	10.0	4.5	7	2	0	0	0	0	0	0	80
K9-5	Whi	449	409	228	8	92	0	8.3	5.6	1	0	0	0	0	0	0	0	74
K9-16	Whi	340	305	170	8	92	0	7.2	4.9	1	1	0	0	0	0	0	0	86
K9-29	Whi	384	296	165	17	83	0	10.6	3.8	6	0	0	0	0	0	0	0	83
K88-24	Whi	305	203	114	16	84	0	8.0	4.0	14	3	0	0	0	0	0	0	76
K88-29	Whi	348	275	153	12	88	0	10.0	3.6	7	1	1	1	0	0	0	0	73
K88-30	Whi	267	184	103	25	75	0	8.6	3.2	3	3	0	0	0	0	30	0	70
LA12-59	Red	343	254	142	15	85	0	7.7	4.6	3	5	3	1	10	0	0	0	76
L33-1	Red	319	259	145	16	84	0	7.4	4.5	1	2	0	0	0	0	10	0	68
L33-2	Red	226	183	102	19	81	0	6.3	3.7	0	0	0	0	0	0	0	0	71
Monona	Whi	334	289	161	8	92	0	7.0	4.9	3	0	0	3	0	0	0	0	73
Norland, Red	Red	347	263	147	18	78	4	8.8	4.1	1	2	3	0	0	0	0	0	62
NY78	Whi	324	256	143	12	88	0	6.7	5.0	9	0	0	0	0	0	0	0	66
NY84	Whi	327	259	145	15	85	0	9.1	3.7	4	1	0	0	0	0	0	0	71
NY88	Whi	143	89	50	30	70	0	4.6	3.2	6	0	0	1	0	0	0	0	83
NY90	Whi	328	227	127	18	82	0	8.6	3.9	13	0	0	0	0	0	0	0	73
NY91	Whi	151	51	28	19	81	0	4.9	3.2	13	23	0	12	20	0	0	0	79

(Continued)

Upstate New York Table 13. - (Continued) - Yield, marketable yield, size distribution, mean tuber number per foot and weight, percentage defects, and specific gravity for the Cayuga County mineral soil variety trial grown at Cato, New York - 1992

Variety or Clone	Class	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. ¹ by Class (% of tot. yld)			Mean Tuber #/ft wt(oz)	Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.	
				1	2	3		S	K	G	R	H	V	N			
NY93	Whi	263	165	92	18	82	0	7.2	3.8	14	4	2	1	0	0	10	78
NY96	Red	266	198	110	19	81	0	7.2	3.8	0	0	6	0	0	0	0	60
NY101	Whi	525	427	239	12	87	1	13.0	4.2	6	1	0	0	0	0	10	74
NYE11-45	Whi	310	223	125	14	86	0	8.0	4.1	14	1	0	0	0	0	0	68
NYE55-44	Whi	261	168	94	18	82	0	6.8	5.0	9	9	1	0	0	0	0	75
Redsen	Red	167	89	50	37	63	0	5.6	3.1	1	5	2	2	0	0	10	64
Snowden	Whi	316	241	135	19	81	0	8.3	4.0	4	1	0	0	0	0	0	89

¹Size categories: 1 = under 2"; 2 = 2 to 4"; 3 = over 4"

²S = Sun-green; K = Knobby/Misshapen; G = Growth Crack; R = Rot

³H = Hollow Heart; V = Vascular Discoloration; N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: This trial was not replicated, except that two replications were planted of Chieftain and Katahdin. The white-skinned entries were planted as a group, separately from the reds.

Plant date: May 5

Vine-kill date: August 10

Harvest date: August 25

Fertilizer: Potash 200 lb/A preplant; 80 gal/A 8-16-8 at planting; two side-dressings of 32% Nitrogen at 10 gal/A each.

Vine-kill: Two applications of Diquat 1 pt/A each.

Upstate New York Table 14. Yield, marketable yield, size distribution, mean tuber number per foot and weight, percentage defects, and specific gravity for the Oswego County muck soil variety trial grown at Fulton, New York - 1992

Variety or Clone	Class	Total Yield cwt/A	Mkt. Yield cwt/A	Yield % of std	Size Distrib. ¹ by Class (% of tot. yld)			Mean Tuber #/ft wt(oz)	Pct. External ² Tuber Defects	Pct. Internal ³ Tuber Defects			Spec. Grav.				
					1	2	3			S	K	G		R	H	V	N
Allegany	Whi	450	384	140	9	91	0	9.7	4.8	6	0	0	0	0	0	0	86
Atlantic	Whi	379	314	114	14	86	0	10.0	3.9	3	0	0	0	5	0	5	103
Castile	Whi	447	382	139	10	87	2	9.8	4.8	3	0	0	0	0	0	0	87
Chieftain	Red	456	381	138	12	88	0	10.7	4.4	3	1	0	0	10	0	0	76
CF7523-1	Whi	432	329	120	21	79	0	13.6	3.3	2	1	0	0	0	0	0	79
Kanona	Whi	333	281	102	9	91	0	8.4	4.1	7	0	0	0	10	0	0	79
Katahdin(std)	Whi	365	275	100	14	86	0	9.3	4.1	10	1	0	0	0	0	0	81
K6-70B	Whi	443	382	139	11	89	0	11.3	4.1	1	2	0	0	0	0	0	85
K6-155	Whi	479	363	132	14	86	0	12.1	4.1	9	0	0	1	0	0	0	90
K7-2	Whi	377	310	113	16	84	0	11.7	3.4	2	0	0	0	0	0	0	91
K7-6	Whi	426	275	100	33	67	0	14.1	3.1	0	2	0	0	0	0	0	79
K7-18	Whi	430	309	112	27	73	0	15.2	3.0	1	0	0	0	0	0	0	83
K8-4	Whi	430	382	139	8	92	0	11.7	3.8	3	0	0	0	0	0	0	99
K8-7	Whi	378	326	119	11	89	0	11.4	3.5	3	0	0	0	0	0	0	82
K9-5	Whi	351	289	105	17	83	0	11.3	3.2	1	0	0	0	0	0	0	92
K9-16	Whi	308	252	92	16	84	0	7.8	4.1	2	0	0	0	0	0	0	92
K9-29	Whi	328	240	87	26	74	0	11.5	3.0	1	0	0	0	0	0	0	102
K88-24	Whi	468	396	144	10	90	0	11.8	4.1	4	0	0	0	0	0	0	87
K88-29	Whi	402	296	108	25	75	0	16.0	2.6	1	0	0	0	0	0	0	83
K88-30	Whi	324	233	85	27	73	0	10.5	3.2	1	0	0	0	0	0	0	78
LA12-59	Red	349	269	98	19	81	0	9.1	4.0	0	4	0	0	10	0	0	90
L33-1	Red	293	240	87	16	84	0	7.3	4.2	0	2	0	0	0	0	0	71
L33-2	Red	275	212	77	21	79	0	8.6	3.3	0	2	0	0	0	0	0	83
Monona	Whi	323	261	95	18	82	0	10.3	3.3	2	0	0	0	0	0	5	79

(Continued)

Upstate New York Table 14. - (Continued) - Yield, marketable yield, size distribution, mean tuber number per foot and weight, percentage defects, and specific gravity for the Oswego County muck soil variety trial grown at Fulton, New York - 1992

Variety or Clone	Class	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. ¹ by Class (% of tot. yld)			#/ft	Mean Tuber wt(oz)	Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.	
				1	2	3			S	K	G	R	H	V	N			
Norland, Red NY78 NY84 NY88 NY90 NY91	Red	362	285	104	17	83	0	11.0	3.4	4	0	0	0	0	0	0	0	71
	Whi	421	365	133	12	88	0	12.1	3.6	1	0	0	0	0	0	0	0	82
	Whi	460	382	139	14	86	0	11.7	4.1	1	2	0	0	0	0	0	0	77
	Whi	314	250	91	18	82	0	9.4	3.5	2	0	0	0	0	0	0	0	88
	Whi	315	223	81	25	75	0	9.6	3.4	3	0	1	0	0	0	0	0	90
NY91	Whi	206	155	56	16	84	0	7.9	2.7	4	5	0	0	0	0	10	0	98
NY93 NY96 NY101 NYE11-45 NYE55-44	Whi	305	221	80	25	75	0	10.2	3.1	2	0	0	0	0	0	0	0	95
	Red	360	297	108	17	83	0	10.9	3.4	1	0	0	0	0	0	0	0	70
	Whi	584	454	165	21	79	0	17.0	3.6	1	0	0	0	0	0	0	0	87
	Whi	340	203	74	40	60	0	10.3	3.4	0	0	0	0	0	0	0	0	83
	Whi	357	285	104	17	83	0	9.2	4.0	1	2	0	0	10	0	0	0	87
Redsen Snowden	Red	170	94	34	40	60	0	6.5	2.7	3	1	0	0	0	0	0	0	72
	Whi	327	217	79	32	68	0	11.9	2.9	1	1	0	0	0	0	0	0	101

¹Size categories: 1 = under 2"; 2 = 2 to 4"; 3 = over 4"

²S = Sun-green; K = Knobby/Misshapen; G = Growth Crack; R = Rot

³H = Hollow Heart; V = Vascular Discoloration; N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: This trial was not replicated, except that two replications were planted of Atlantic, Chieftain, and Monona. The white-skinned varieties were planted as a group, separately from the reds.

Plant date: May 28

Vine-kill date: September 9

Harvest date: October 5

Fertilizer: Potash 200 lb/A preplant; 50 gal/A 8-10-8 at planting; one side-dressing of 32% Nitrogen at 10 gal/A.

Vine-kill: Two applications of Diquat 1 pt/A each.

Upstate New York Table 15. Yield, marketable yield, size distribution, percentage defects, and specific gravity for the Wayne County muck soil red-skinned variety trial grown at Savannah, New York - 1992.

Variety or Clone	Class	Total Yield cwt/A	Mkt. Yield % of cwt/A std.	Size Distrib. ¹ by Class (% of tot. yld)						Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.
				1	2	3	S	K	G	R	H	V	N					
B0615-1	Red	273	184	63	23	75	3	6	1	3	0	0	0	0	0	60		
B0616-1	Red	362	277	95	19	75	6	2	0	3	0	0	0	0	0	66		
B0800-12	Red	242	143	49	23	70	7	11	2	4	1	20	10	0	0	64		
B0806-13	Red	413	284	97	30	70	0	0	0	0	0	0	0	0	0	66		
B0808-3	Red	359	169	58	47	53	0	4	2	0	0	20	0	0	0	75		
B0808-4	Red	449	231	79	40	60	0	5	4	0	0	0	0	0	0	75		
B0811-2	Red	364	144	49	48	52	0	4	6	2	0	0	0	0	0	72		
B0811-13	Red	382	262	90	21	79	0	9	2	0	0	0	0	0	0	73		
B0850-4	Red	242	95	33	58	42	0	1	1	0	1	0	0	0	0	64		
B0852-7	Pur	349	161	55	16	82	2	20	8	10	0	0	20	0	0	66		
B0899-5	Red	175	75	26	52	48	0	0	4	0	1	0	10	0	0	60		
B0903-2	Pur	517	345	119	11	84	5	15	0	6	1	0	0	0	0	77		
B0918-5	Pur	231	155	53	31	69	0	0	0	0	2	0	0	0	0	77		
B0984-1	Red	277	173	59	15	78	7	6	10	6	2	0	0	10	0	71		
B0985-1	Red	331	147	50	43	57	0	4	1	6	1	0	0	0	0	60		
B0985-3	Red	265	183	63	25	69	5	5	0	0	0	0	10	0	0	60		
B0985-7	Red	196	64	22	35	65	0	18	5	10	0	0	30	0	0	60		
B0994-3	Red	303	158	54	27	73	0	15	3	2	0	0	0	0	0	66		
Chieftain (std)	Red	434	291	100	17	80	2	11	3	2	0	0	0	0	0	66		
LA12-59	Red	374	236	81	15	74	11	15	5	2	1	0	0	0	0	71		

(Continued)

Upstate New York Table 15. - (Continued) - Yield, marketable yield, size distribution, percentage defects, and specific gravity for the Wayne County muck soil red-skinned variety trial grown at Savannah, New York - 1992.

Variety or Clone	Class	Total Yield cwt/A	Mkt. Yield % of cwt/A std.	Size Distrib. ¹ by Class (% of tot. yld)						Pct. External ² Tuber Defects			Pct. Internal ³ Tuber Defects			Spec. Grav.
				1	2	3	S	K	G	R	H	V	N			
L33-1	Red	273	173	60	23	66	12	6	8	0	0	10	0	0	64	
L33-2	Red	228	153	53	22	66	12	4	4	0	2	0	0	0	64	
NY96	Red	207	117	40	36	64	0	3	3	1	0	0	0	0	60	
Norland, Dk.Rd.	Red	384	231	79	31	69	0	7	1	1	0	10	0	0	64	
Redsen	Red	182	102	35	37	63	0	7	0	1	0	5	0	0	62	

¹Size categories: 1 = under 2"; 2 = 2 to 4"; 3 = over 4"

²S = Sun-green; K = Knobby/Misshapen; G = Growth Crack; R = Rot

³H = Hollow Heart; V = Vascular Discoloration; N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: This trial was not replicated, except that two replications were planted of Chieftain and Redsen.

Plant date: May 14

Vine-kill date: September 5

Harvest date: November 5

Fertilizer: 1000 lb/A 7.9-7.8-31.4-2.2Mg-0.5Mn; Side-dressed 400 lb/A 22-0-21.

Vine-kill: Diquat 1 pt/A

Upstate New York Table 16. Yield, marketable yield, size distribution, mean tuber number per foot and weight, percentage defects, and specific gravity for the Steuben County mineral soil variety trial grown at Arkport, New York - 1992

Variety or Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. ¹ by Class (% of tot. yld)			Mean Tuber #/ft wt(oz)	Pct. External ² Tuber Defects					Pct. Internal ³ Tuber Defects					Spec. Grav.
			1	2	3		S	K	G	R		H	V		N		
AC Novachip	224	114	33	21	79	0	12	9	1	6	20	10	10	89			
Allegany	571	500	146	4	72	25	2	3	3	0	0	0	0	83			
Atlantic (std)	397	343	100	8	85	7	1	3	1	0	10	0	0	102			
Castile	521	460	134	9	71	20	2	1	0	0	0	10	0	90			
CF7523-1	521	411	120	15	85	0	4	2	0	0	0	0	0	86			
Kanona	469	442	129	3	60	37	1	0	0	1	10	0	0	83			
MaineChip	259	127	37	33	67	0	2	3	13	0	20	0	0	89			
Monona	497	418	122	9	79	12	1	6	0	0	10	0	5	77			
Norwis	543	501	146	3	71	26	0	3	1	0	20	0	10	74			
NY88	332	275	80	11	82	6	2	2	2	0	10	0	0	90			
NY89	282	218	64	13	85	2	4	1	3	2	70	0	0	82			
NY90	405	350	102	10	85	5	0	0	3	0	10	0	0	81			
NY91	292	265	77	8	83	9	1	0	0	0	40	0	0	96			
NY93	392	342	100	10	86	3	1	1	0	0	50	0	0	90			
NY94	472	432	126	4	80	15	0	1	3	0	10	0	0	86			
NY95	313	235	69	16	76	8	0	8	1	0	20	0	0	97			
NYE11-45	507	444	130	9	86	5	2	1	0	0	0	0	0	77			
NYE55-35	416	340	99	15	83	3	2	1	0	0	0	0	0	99			
NYE55-44	443	380	111	11	85	4	1	0	1	0	0	0	0	84			
NYE57-13	452	383	112	12	84	3	2	1	0	0	10	0	0	78			
Snowden	411	370	108	8	87	5	1	1	0	0	20	10	0	98			

¹Size categories: 1 = under 2"; 2 = 2 to 4"; 3 = over 4"

²S = Sun-green; K = Knobby/Misshapen; G = Growth Crack; R = Rot

³H = Hollow Heart; V = Vascular Discoloration; N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: This trial was not replicated, except that two replications were planted of Atlantic and Monona.

Plant date: May 19

Vine-kill date: September 10

Fertilizer: 1600 lb/A 8-16-8 at planting

Vine-kill: Diquat 1 qt/A

Harvest date: September 24

Upstate New York Table 17. Yield, marketable yield, size distribution, mean tuber number per foot and weight, percentage defects, and specific gravity for the Wyoming County mineral soil variety trial grown at Hermitage, New York - 1992

Variety or Clone	Total Yield cwt/A	Mkt. Yield % of cwt/A	Size Distrib. ¹ by Class (% of tot. yld)						Mean Tuber #/ft wt(oz)	Pct. External ² Tuber Defects				Pct. Internal ³ Tuber Defects				Spec. Grav.
			1	2	3	4	5	6		S	K	G	R	H	V	N		
AC Novachip	612	497	108	5	79	16	8.8	7.6	4	5	4	1	0	0	10	82		
Allegany	658	575	124	3	85	12	10.1	7.2	4	3	2	0	0	0	0	79		
Atlantic (std)	517	462	100	4	92	5	8.5	6.7	2	2	3	1	0	0	15	92		
Castile	692	613	133	4	88	8	13.0	5.9	3	5	0	0	0	0	0	83		
CF7523-1	664	598	129	5	91	4	12.5	5.9	2	3	0	0	0	0	0	82		
Kanona	582	528	114	3	89	9	10.3	6.3	3	3	0	0	0	0	0	85		
MaineChip	338	287	62	8	89	2	8.1	4.6	1	5	0	0	0	0	0	91		
Monona	551	479	104	6	85	9	9.9	6.1	2	3	1	1	5	0	5	75		
Norwis	536	512	111	2	77	22	7.1	8.4	1	1	1	0	0	0	20	71		
NY88	428	387	84	5	91	4	8.8	5.4	1	1	1	1	0	0	5	85		
NY89	271	215	47	5	92	3	5.6	5.3	4	6	5	0	0	0	0	87		
NY90	385	326	71	10	88	2	9.5	4.5	4	1	0	0	0	0	0	83		
NY91	351	293	63	10	90	0	8.2	4.7	1	4	0	1	0	0	0	86		
NY93	401	344	74	9	91	0	10.4	4.3	2	1	2	0	30	0	0	90		
NY95	485	433	94	7	88	5	10.3	5.2	1	3	0	0	0	0	0	91		
NYE11-45	530	440	95	8	91	1	9.5	6.1	4	3	1	1	0	0	0	71		
NYE55-35	483	435	94	6	93	1	11.2	4.8	2	2	0	0	0	0	0	88		
NYE55-44	343	278	60	7	93	0	7.3	5.2	3	9	0	1	0	0	0	83		
NYE57-13	430	394	85	8	92	0	11.2	4.2	1	0	0	0	10	0	0	80		
Snowden	561	538	117	4	95	1	10.3	6.0	0	0	0	0	10	0	0	94		

¹Size categories: 1 = under 2"; 2 = 2 to 4"; 3 = over 4"

²S = Sun-green; K = Knobby/Misshapen; G = Growth Crack; R = Rot

³H = Hollow Heart; V = Vascular Discoloration; N = Internal Necrosis. Based on a 10-tuber sample per plot.

NOTE: This trial was not replicated, except that two reps were planted of Atlantic, Monona, and NY88.
 Plant date: May 12
 Vine-kill date: September 14
 Harvest date: September 24
 Fertilizer: 1250 lb/A 10-20-15-2Mg at planting; Side-dressed 60 lb/A of Nitrogen.
 Vine-kill: Diquat 1 pt/A

OHIO

M.A. Bennett, E.M. Grassbaugh, R.L. Hassell,
K.M. Kelly, R.C. Rowe, E.C. Wittmeyer

INTRODUCTION

The purpose of the statewide potato variety trials is to test new varieties for the benefit of Ohio growers and processors when these varieties are grown under various farm conditions. Cultural and pest control practices in each case are those used by the cooperating grower. Plant stands are recorded in the fields. At harvest, the tubers are evaluated, weighed, and graded, with samples taken for chipping tests.

Fifteen cultivars were planted at each of three farms in 1992. These farms were selected to give different soil and climatic conditions. The cultivars were selected either because they looked promising in previous statewide trials, and in the previous observation trials on two cooperating farms, or were selected from the cultivar plots at the Ohio Agricultural Research and Development Center (OARDC), Wooster.

Farm Locations

The three farms referred to in the introduction and throughout this publication are as follows:

Farm 1 (M) - Michael Farms, Urbana, Champaign County

Farm 2 (L) - Logan Farms, Mt. Gilead, Morrow County

Farm 3 (W) - Ohio Agricultural Research and Development Center (OARDC), Wooster, Wayne County

See Table 1 for summary of cultural practices followed on these cooperating farms -- planting dates, harvest dates, plant spacing and related information.

PROCEDURES

Fifteen cultivars were planted in four replicates on each of the three farms. Thirty seed pieces were planted in each replicate. In addition, 10 red-skinned varieties were planted in four replications at Farm 1. Four yellow-flesh varieties with 4

replicates were tested at Farm 3. Two single-observation trials, Beltsville (18 varieties) and Louisiana (15 varieties) were also planted at Farm 3, with 1 replication of each variety.

The seed potatoes were cut and treated on May 5, 1992. Farm 1 was planted on May 12, Farm 2 was planted on May 15 and Farm 3 was planted on May 20. All were harvested from September 15 to October 1, 1992. The potatoes were harvested with flat bed diggers, then picked up and weighed. Representative 40 pound samples were collected, then graded on September 30 (Farm 1), October 1 (Farm 2), and October 27 (Farm 3). Atlantic, Katahdin, and Superior were standard varieties used for comparison. At grading, ten tubers from each replication were cut for internal defects. A sample of each cultivar was taken to The Ohio State University pilot plant (Columbus) for chip tests. Potatoes were stored at 52°F until they were processed on October 22 and November 3, 1992.

WEATHER AND GROWING CONDITIONS

Below average temperatures and above average rainfall occurred in Ohio during the 1992 growing season. See Table 2 and 1992 North Central Report for specific data.

OBSERVATIONS AND VIEWPOINTS ON THE 1992 PLOTS

Every potato grower knows 1992 was an unusual year from the standpoint of weather conditions - moderate temperatures and excessive rainfall in various areas. In Eastern U.S., these weather conditions favored excellent yields in most major producing areas such as Maine, parts of Pennsylvania, Michigan and other states competing with Ohio. These high yields, e.g. 370 cwt. in Wisconsin, 300 cwt. in Michigan, 320 cwt. in Upstate New York, and Ohio's yield of 240 cwt. in 1992 compared with 185 cwt. in 1991 reflect the effect of environment - rainfall and temperatures on yield of potatoes.

When you study this report on the 1992 potato trials, be sure to remember the temperatures during the major months, June-July-August, when very

few days had temperatures above 90°F. Ordinarily, Ohio growers do not have such favorable growing conditions.

cultivars ranged from 70 to 88% (Table 5).

FIELD OBSERVATIONS

The average percent stand at Farm 1 was 70%; Farm 2 was 66%; and Farm 3 was the highest with an average of 86% (Table 2). However, Farm 1 had the highest yields at harvest. The average percent stand for all three locations was 74%; one of the lowest on record.

Observations are made under field conditions when plots are harvested. Tuber shape, color and surface texture are noted, along with uniformity and cultivar yielding ability. Observations are recorded on each replication. These observations, along with yield data help determine if cultivars warrant further testing under Ohio growing conditions.

Several cultivars looked promising in 1992:

MaineChip - round to oval tubers with uniform surface with good overall appearance

Gemchip - Round to oval tubers with light buff skin; fairly uniform tubers; good yielding ability, trace of surface scab

Somerset - smooth tuber surface; tubers hold their shape quite well even under adverse growing conditions; uniform shape and size; slight surface scab

Eide Russet - looked promising at two of the sites in 1992; oblong to long russet-type with heavy russetting, good uniformity; cultivar holds its shape well; uniform shape but small size. Needs more testing under stressful growing conditions.

In summary, many new cultivars are being released. Growers should make an effort to plant a small plot of these promising new cultivars which are mentioned in this report.

GRADES AND YIELDS

The following tables present yield information as well as grades and defects. The average total yields for the three locations ranged from 333 cwt/A to 561 cwt/A. Farm 1 had total yields ranging from 376 cwt/A to 764 cwt/A. The mean percent U.S. number 1's for the 15 main trial

SOIL ANALYSES OF STATEWIDE TRIAL PLOTS - 1992

-----Cooperating Farms-----

Test Results	1(M)	2(L)	3(W)*
pH	6.4	6.9	
P (lb/A)	616	106	
K (lb/A)	373	356	
CA (lb/A)	3520	3960	
Mg (lb/A)	508	627	
CEC (meq/100g)	14	13	
Ca (% base sat.)	64	76	
Mg (% base sat.)	15	20	
K (% base sat.)	3.5	3.5	
Zn (lb/A)	35.7	22.2	
B (lb/A)	1.0	1.3	
OM (%)	2.4	3.7	
Mn (lb/A)	53	29	
Fe (lb/A)	152	180	
Cu (lb/A)	2.9	5.1	
NO ₃ N (lb/A)	30	30	

Cooperating Farms:

1 = Michael Farms, Urbana

2 = Logan Farms, Mt. Gilead

3 = Ohio Agricultural Research and Development Center, Wooster

Soil analyses conducted at Research-Extension Analytical Lab, The Ohio Agricultural Research and Development Center, Wooster.

* Soil samples were not collected at Wooster

Table 1. Cultural and pest control practices and rainfall totals for Ohio statewide potato trials – 1992.

	<u>Farm 1 (M)</u>	<u>Farm 2 (L)</u>	<u>Farm 3 (W)</u>
Date planted	May 12	May 15	May 20
Date harvested	September 30	October 1	September 15
1991 crop	Green Beans	Corn	Alfalfa
Cover crop	Rye	None	Winter wheat – for plow down
Fertilizer applied in row	1150 lbs. 13-20-20 at planting	lbs. 150-175-175 30S, Mg 15#	1200 lbs. 10-20-20 (1/2 at plowdown; 1/2 at planting)
Herbicide	Dual, Sencor	Dual, Lorax	Dual, Sencor
Insecticide	Guthion, Thiodan, Asana, Monitor	Phorate	Asana, Pounce, Guthion, Monitor
Spacing	8" X 36"	8" X 36"	12" X 36"
Soil type	Silt loam	Brookston silt loam	Wooster silt loam
Soil conditions at planting	Good	Average	Excellent
Irrigation	No	No	No
Monthly Rainfall Totals (Inches)			
May	3.74	N/A	1.19 (5/20-5/31)
June	4.38	2.83	2.15
July	13.61	11.26	8.30
August	3.60	2.93	4.03
September	<u>2.83</u>	<u>0.84 (as of 9/7)</u>	<u>0.61 (9/1-9/15)</u>
Season Total	28.16	17.86	16.28

Table 2. Stand counts for Ohio statewide trials and yellow trial, 1992.

<u>MAIN TRIALS</u>				
--- Cooperating Farms ---				
	1(M)	2(L)	3(W)	
Date stand counts were taken:	June 20	June 22	June 25	
Days after planting:	39	38	36	
<u>Cultivar</u>	<u>-----% Stand-----</u>			<u>Mean</u>
W870	67	64	82	71
Castile	76	73	94	81
Mainechip	74	69	97	80
Snowden	74	78	93	82
W887	61	63	78	67
Eide Russet	82	77	83	81
Labelle	64	55	49	56
Superior	64	67	85	72
Gemchip	66	62	88	72
S-3	73	69	81	74
Atlantic	54	48	86	63
AF1060-2	66	69	93	76
Somerset	83	69	88	80
AC80545-1	75	70	93	79
Katahdin	73	63	93	76
Farm Mean	70	66	86	74
<u>YELLOW TRIAL: Planted at Wooster only</u>				
Yukon Gold			80	
Saginaw Gold			93	
Carolla			83	
MS401-1Y			86	
Mean			86	

Table 3. Stand counts for observational trials, Wooster, OH, 1992.

BELTSVILLE OBSERVATION TRIAL

<u>Cultivar</u>	<u>% Stand</u>
CS7232-4	87
AF845-11	100
CS7697-24	70
B0339-1	77
B0717-1	87
B9792-8B	87
B0220-14	97
B0493-8	73
B0169-56	90
B0178-35	83
B0178-34	87
B0682-6	90
B0329-1	90
B0613-2	57
B0257-12	93
B09922-11	77
B0175-20	73
B0585-1	80
Mean	83

LOUISIANA OBSERVATION TRIAL

<u>Cultivar</u>	<u>% Stand</u>
LA81-107	67
LA91-44	83
LA91-39	67
LA91-60	90
LA91-116	97
LA81-22	90
LA91-12	97
LA81-9	63
LA81-44	90
LA81-4	80
LA91-42	100
LA91-160	97
LA71-63	77
LA91-18	97
LA91-127	27
Mean	81

Table 4. Percent B's, culls, internal defects; Major external defects for main trials, 1992.

<u>Cultivar</u>	<u>AVERAGE OF 3 LOCATIONS</u>			<u>Major External Defects 1</u>
	<u>% B's</u>	<u>% Culls</u>	<u>Internal Defects</u> <u>% Hollow Heart</u>	
W870	12.3	4.7	18.1	sh, gr, sc
Castile	14.7	8.7	3.9	sh, gr, 2nd
Mainechip	11.3	5.3	13.5	sh, gr, cr, 2nd, sc
Snowden	17.7	3.3	6.7	sh, gr, sc, 2nd
W887	7.7	5.0	3.3	sh, 2nd, gr
Eide Russet	24.3	5.7	1.0	sh, rot
Labelle	4.7	8.7	1.1	sh, gr, 2nd
Superior	9.0	8.0	1.7	sh, 2nd
Gemchip	10.7	6.3	14.2	gr, sc, 2nd
S-3	3.7	11.3	4.2	sh, sc, gr, 2nd
Atlantic	8.3	12.0	31.7	sh, gr, cr
AF1060-2	12.7	7.3	0	sh, gr, 2nd
Somerset	16.0	5.3	10.8	sh, gr, 2nd
AC80545-1	6.3	9.3	4.2	sh, gr, sc, 2nd
Katahdin	6.0	11.3	13.3	gr, sh, cr
Mean	11.0	7.5	8.5	

1 Abbreviations for external defects

Sh = misshapen
 2nd = second growth
 Cr = growth cracks
 Gr = greening
 Sc = scab

Table 5. Total yield, percent U.S. No. 1 and marketable yield for main trial potato cultivars, Ohio statewide trials - 1992.

Cultivar	-----Farm 1 (M)-----			-----Farm 2 (L)-----			-----Farm 3 (W)-----			-----Mean of 3 Farms-----		
	Yield	No. 1	No. 1	Yield	No. 1	No. 1	Yield	No. 1	No. 1	Yield	No. 1	No. 1
	Cwt/A	%	Cwt/A	Cwt/A	%	Cwt/A	Cwt/A	%	Cwt/A	Cwt/A	%	Cwt/A
W870	518	91	471	263	72	189	297	86	255	359	83	298
Castile	662	85	563	319	70	223	370	75	278	450	75	338
Mainechip	513	90	462	315	74	233	428	86	368	418	83	347
Snowden	601	89	535	247	63	156	269	85	229	372	79	294
W887	562	91	511	472	86	406	185	86	159	406	88	357
Eide Russet	551	81	446	350	62	217	307	67	206	403	70	282
Labelle	700	93	651	262	88	231	224	79	177	395	87	344
Superior	376	87	327	233	82	191	396	80	317	335	83	278
Gemchip	556	91	506	288	74	213	399	84	335	414	83	344
S-3	764	88	672	459	85	390	329	90	296	517	88	455
Atlantic	368	88	324	286	72	206	437	63	275	364	74	269
AF1060-2	583	88	513	328	73	239	384	79	303	432	80	346
Somersset	584	87	508	417	65	271	278	84	234	426	79	336
AC80545-1	592	91	539	421	87	366	273	74	202	429	84	360
Katahdin	488	88	429	444	85	377	416	75	312	449	83	373
Mean	561	89	499	340	76	258	333	79	263	411	81	333

Table 6. Mean U.S. No. 1 yields in cwt. per acre for major entries in the Ohio statewide potato trials of all farms each year grown in the last ten years and grown more than one year.

Cultivar	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
<u>Early & Med. Early</u>										
Superior						131		207	224	278
Conestoga	141	230	266	321	225					
Rus. Norkotah				302	272	105				
<u>Early Midseason</u>										
Langlade (W718)						181	188			
Norchip	184	208	228	301	236	160	161	235		
<u>Midseason</u>										
Snowden (W855)							167		231	373
LA01-38 (LaBelle)			359	413	330	233	211	272		344
Katahdin	238	315	335	363	276	187	178	246	251	373
Atlantic							193	260	260	269
<u>Late</u>										
Castile (B7592-1)							191	280	238	338
Allegany (N.Y.72)						213	184		192	
Denali	206									
Elba (NY59)	245			393						
Neb.A129-69-1	207	278								
WNC521-12			325	344						
MS700-70				378	281	232	187	230	263	
Gemchip (BR7093-24)								268	230	344
Steuben (NY81)						235	215	224		

Some of the cultivars grown in Ohio for which the characteristics are well known after several years of testing have been omitted in later years. Some cultivars listed were included in the trials prior to the last ten years. Katahdin, Atlantic and Superior are well known and used as standards for comparison.

Table 7. Specific gravity, chip color, percent blister, and Agtron E-5F readings of potato cultivars grown at three farms in statewide trials, 1992.

Cultivar	-----Farm 1(M)-----				-----Farm 2(L)-----			
	Specific Gravity	Chip Color y	% z Blister	Agtron	Specific Gravity	Chip Color y	% z Blister	Agtron
W870	1.089	4	10	22.9	1.087	3	30	39.6
Castile	1.084	4	20	27.7	1.083	5	40	17.7
Mainechip	1.090	1	20	52.3	1.084	2	10	51.1
Snowden	1.085	3	10	48.1	1.092	3	20	43.1
W887	1.084	2	20	49.9	1.097	3	10	39.1
Eide Russet	1.083	4	20	20.8	1.083	4	30	24.1
LaBelle	1.086	4	20	23.9	1.077	4	20	25.9
Superior	1.073	5	20	17.4	1.075	5	20	23.4
Gemchip	1.068	3	30	26.9	1.085	4	20	34.0
S-3	1.085	3	20	42.1	1.093	2	30	43.3
Atlantic	1.084	2	10	52.5	1.093	3	20	40.1
AF1060-2	1.073	4	20	20.7	1.079	3	10	42.1
Somerset	1.087	2	10	52.8	1.086	4	30	23.5
AC80545-1	1.075	3	0	44.5	1.086	2	0	45.6
Katahdin	1.072	4	10	18.2	1.080	4	10	25.4
Mean	1.076	3	15	32.5	1.085	3.4	20	34.5

Cultivar	-----Farm 3(W)-----				-----Mean of 3 Farms-----			
	Specific Gravity	Chip Color y	% z Blister	Agtron	Specific Gravity	Chip Color y	% z Blister	Agtron
W870	1.093	5	40	11.0	1.090	4.0	27	24.5
Castile	1.078	5	30	17.6	1.082	4.7	30	21.0
MaineChip	1.087	2	0	54.4	1.087	1.7	10	52.6
Snowden	1.089	3	10	44.0	1.089	3.0	13	31.9
W887	1.088	4	20	19.0	1.090	3.0	17	36.0
Eide Russet	1.074	5	20	14.1	1.080	4.3	23	19.7
LaBelle	1.076	4	20	24.0	1.080	4.0	20	24.6
Superior	1.080	1	10	41.0	1.076	3.7	17	27.3
Gemchip	1.073	3	40	29.3	1.075	3.3	30	19.9
S-3	1.090	4	20	22.4	1.089	3.0	23	35.9
Atlantic	1.092	3	20	28.0	1.090	2.7	17	40.2
AF1060-2	1.070	4	30	25.9	1.074	3.7	20	29.6
Somerset	1.085	3	10	36.8	1.086	3.0	17	37.7
AC80545-1	1.077	2	0	45.1	1.079	2.3	0	45.1
Katahdin	1.068	3	20	28.3	1.073	3.7	13	24.0
Mean	1.081	3.4	19.3	29.4	1.081	3.3	18	32.1

y PC/SFA Standards; 1=light (high Agtron index readings), 5=dark (low Agtron index readings)

z Percentage of chips that develop blisters > 20mm in diam. during the frying process

Table 8. Plant stand, total yields, U.S. No. 1 yields, grade distribution, and internal disorders for Red Potato Trial entries, grown at Michael Farms, Urbana, OH - 1992.

Cultivar	% Plant Stand	Total Yield	U.S. No. 1 Cwt/A	U.S. No. 1	B		Culls		Internal Disorders (%)	
					Size	% -----	Hollow Heart	Internal Necrosis		
Dark Red Norland	82	233	182	78	2	20	0	0	0	
Dark Red Norland II	81	198	160	81	1	18	0	0	0	
LA12-59	80	317	282	89	3	8	3	0	0	
LA72-12	62	254	201	79	14	7	5	0	0	
ND2224-5R	70	240	192	80	1	19	0	0	0	
Super Red	81	182	144	79	3	18	0	0	0	
W1061-R	74	216	173	80	0	20	0	0	0	
W8344-R	73	238	181	76	2	22	0	0	0	
W8475-R	65	56	27	49	1	50	0	0	0	
W84178-R	96	203	166	82	2	16	0	0	0	

All data based on 4 replications

PLANTING DATE: May 2, 1992

HARVEST DATE: August 25, 1992

Cultural practices and plant spacing, See Table 1.

z Hollow heart and internal necrosis ratings indicate the percentage of affected tubers found in 40 tubers sampled

Table 9. Plant stand, total yields, U.S. No. 1 yields, grade distribution, and internal disorders for yellow flesh potato trial entries, Wooster - 1992.

Cultivar	% Plant Stand	Total Yield Cwt/A	U.S. No. 1 Cwt/A	U.S. No. 1 %	B Size %	Z									
						-----					-----				
						Culls	Tuber Color	Skin Texture	Tuber Shape	Eye Depth	Appearance	Hollow Heart	Internal Necrosis		
Yukon Gold	80	310	223	72	2	26	6.0	6.0	3.7	5.0	4.3	47	0		
Saginaw Gold	93	418	347	83	5	12	6.7	6.3	3.0	5.7	5.7	0	0		
Carolla	55	445	227	51	7	42	5.7	6.7	5.3	5.0	3.0	0	0		
MS401-1Y	88	420	370	88	5	7	5.8	5.5	2.0	5.0	6.8	35	0		

Observation Trials (Wooster) Table 1. Total yields, U.S. No. 1 yields, grade distribution, tuber data and internal disorders for Beltsville observation trial entries – 1992.

Cultivar	Yield Cwt/A	Total No. 1 Cwt/A	U.S. No. 1	z									
				-----Tuber Data-----									
				B size %	Culls	Tuber Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appearance	Internal Necrosis	Hollow Heart	Vascular Discoloration
CS7232-4	191	167	87	4	9	5.5	6	7	5	3.5	0	0	0
AF845-11	186	83	45	5	50	5	6	3	3	3	0	0	0
CS7697-24	283	183	65	8	27	6.5	6	3	7	6	0	0	0
B0339-1	332	223	67	8	25	4	2.5	7	6	6.5	0	3	0
B0717-1	414	349	84	9	7	6	5	2	6	6	0	0	0
B9792-8B	361	211	58	3	39	5.5	5	4	4	3	0	3	0
B0220-14	392	263	67	5	28	4	2	7	6	6	0	6	0
B0493-8	414	324	78	7	15	4	2	8	7	4	0	1	0
B0169-56	392	284	72	15	13	4	3	7	6	5	0	2	0
B0178-35	348	297	85	4	11	5.5	6	6	6	3	0	2	0
B0178-34	397	251	63	5	32	5	5	3	5	5	0	1	0
B0682-6	254	227	90	4	6	5.5	5	2	6	5	0	0	0
B0329-1	440	302	68	4	28	4	3	8	6	5	0	2	0
B0613-2	307	212	69	3	28	5	5	3	4	3	0	1	0
B0257-12	370	295	80	2	18	5.5	6	4	5	4	0	1	0
B9922-11	293	167	57	2	41	5	2	7	6	6.5	0	1	0
B0175-20	295	125	42	4	54	6	6	6	6	4	0	2	0
B0585-1	346	265	77	3	20	6	6	2	6	6	0	0	0

z Tuber Data Rating System:

Tuber Color: 1)purple 2)red 3)pink 4)dark brown 5)brown 6)tan 7)buff 8)white 9)cream

Skin Texture: 1)part russet 2)heavy russet 3)mod. russet 4)light russet 5)netted 6)slight net. 7)mod. smooth 8)very smooth

Tuber Shape: 1)round 2)mostly round 3)round to oblong 4)mostly oblong 5)oblong 6)oblong to long 7)mostly long 8)long 9)cylindrical

Eye Depth: 1)very deep 2)deep 4)intermediate 6)shallow 8)very shallow

Appearance: 1)very poor 2)poor 4)fair 6)good 8)excellent

y Hollow heart and internal necrosis ratings indicate the number of affected tubers found per 10 tubers sampled.

Observation Trials (Wooster) Table 2. Total yields, U.S. No. 1 yields, grade distribution, tuber data and internal disorders for Louisiana observation trial entries, 1992.

Cultivar	Yield Cwt/A	Total No.1 Cwt/A	U.S.		Culls %	Tuber Data*				Internal Disorders				z
			No.1	B size		Tuber Color	Skin Texture	Tuber Shape	Eye Depth	Overall Appearance	Internal Necrosis	Hollow Heart	Vascular Discoloration	
LA81-107	201	171	85	5	10	7	7	3	7	7	0	0	0	0
LA91-44	58	30	51	32	17	6	7	3	5	3	0	0	0	0
LA91-39	90	69	77	23	0	7	6.5	5	6	5	0	0	0	0
LA91-60	307	218	71	10	19	6	6	3	5	3	0	0	0	0
LA91-116	232	186	80	6	14	7	6	2	5	4	0	0	0	0
LA81-22	365	300	82	3	15	5.5	6	3	5	4	0	0	0	0
LA91-12	220	174	79	16	5	6	7	4	6	5	0	0	0	0
LA81-9	196	123	63	11	26	6	6	3	5	5	0	1	0	0
LA81-44	341	164	48	3	49	5.5	6	3	4	3	0	1	0	0
LA81-4	264	156	59	5	36	6	7	2	6	5	0	0	0	0
LA91-42	206	142	69	5	26	5.5	6	3	7	4	0	2	0	0
LA91-160	312	240	77	11	12	5	5	2	5	6	0	1	0	0
LA71-63	186	130	70	4	26	5.5	6	6	7	5	0	4	0	0
LA91-18	150	135	90	5	5	5	6	2	6	6	0	0	0	0
LA91-127	65	41	63	9	28	5	5	3	5	5	0	0	0	0

z Internal Disorder ratings indicated the number of affected tubers found per 10 tubers sampled.

* Tuber Rating System, see Observation Table 1.

Mark Bennett, Elaine Grassbaugh, John Elliott,
David Kelly,
Gene Wittmeyer and Richard Hassell
The Ohio State University, Columbus and
Wooster, OH

Introduction: Thirty-two varieties and clones were tested in 1992 at the Ohio Agricultural Research and Development Center, Wooster, as part of the NE107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast).

Methods: Plots were planted on May 20, 1992, with 30 hills spaced 12 inches apart, in rows 36 inches apart. A randomized complete block design with 4 replications was used. Soil type was a Wooster silt loam (fine-loamy, mixed, mesic Typic Fragiudalf) with a pH of 6.0 and an organic matter of 3.0%. Fertilization consisted of 1200 lbs/A of 10-20-20 fertilizer. One-half was applied at plow-down, and the remainder banded at planting. Herbicides used were Dual and Sencor. Pesticides included Bravo, Penncozeb, Dithane, Pounce, Asana, Monitor, and Guthion. Plots were vine killed (rotary mower) on September 1, which was 104 days after planting. All plots were mechanically harvested on September 15, 1992. Chip samples were stored at 52°F and chipped 37 days after harvest. Chip color was evaluated using the standards established by the Potato Chip/Snack Food Association (PC/SFA). Objective color measurements were made with the Agtron E-5F. Specific gravity was determined using the potato hydrometer method. Hollow heart and internal necrosis ratings (Ohio Table 2) indicate the percentage of affected tubers found per 40 tubers examined.

Results: Top-yielding entries included NDT9-1068-11R, NY84, AF828-5, B0241-8, NYE11-45, Norland, AC Novachip, B0257-12, LA12-59, MaineChip, and Norchip. These ten varieties/clones produced total yields ranging from 444 cwt/A to 573 cwt/A, and percentage of U.S. No. 1 ranged from 63-86%. Entries with specific gravity above 1.080 included B0178-34, B0175-20, B0241-8, NY85, B0257-12, MaineChip, AC Novachip, NC012-19, Norchip, and Atlantic. Potential for hollow heart was noted for one of the ten top-yielding entries, B0241-8, with 30% of the sampled tubers affected. Other entries with serious hollow heart problems included B0175-20, Russet Norkotah, NDT9-1068-11R, LA17-59, NC012-19, and Katahdin.

Early blight readings were not made due to lack of disease pressure. Plant data (size and maturity) at vine kill were not taken due to the extremely vegetative state of the plants. Rainfall during the 1992 growing season was 16.28 inches; 1.14 inches above the long-term average for Wooster.

Ohio Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity for varieties grown at Wooster, Ohio - 1992.

Variety	Total Yield Cwt/A	Marketable Yield		Size Distribution by Class (% of Total Yield)			Specific Gravity
		U.S. #1's Cwt/A	% of STD	U.S. No.1 (>1-7/8")	B Size	Culls	
AF1060-2	384	304	92	79	11	10	1.070
B0178-34	408	332	98	82	5	14	1.090
AF828-5	510	430	123	84	3	12	1.073
B0175-20	420	246	101	58	3	39	1.089
B0241-8	490	425	118	86	4	9	1.087
Russet Norkotah	423	327	102	77	8	15	1.073
B0172-15	374	274	90	73	3	24	1.077
Superior	396	317	95	80	4	16	1.080
NY85	378	320	91	85	6	9	1.088
Monona	324	271	78	84	5	11	1.075
B0257-12	461	375	111	81	4	14	1.089
Castile	370	277	89	75	6	19	1.078
Eide Russet	307	204	74	67	18	15	1.074
Gemchip	399	337	96	84	6	10	1.073
MaineChip	428	369	103	86	5	9	1.087
NDT9-1068-11R	573	394	138	69	4	27	1.070
ND1538-1Rus	344	168	83	49	12	39	1.070
LA12-59	444	348	107	78	4	18	1.068
AC Novachip	466	311	112	67	5	27	1.090
NY84	519	411	125	79	4	18	1.068
NYE11-45	480	394	115	82	4	14	1.074
ND2224-5R	293	243	70	83	11	5	1.071
NC012-19	431	378	104	88	3	10	1.085
Katahdin (std)	416	311	100	75	3	22	1.068
Norland	476	399	114	84	6	10	1.070
Norchip	437	276	105	63	7	30	1.085
Atlantic	436	343	105	79	4	17	1.092

W.D. LSD 62.4 55.9
(K=100;5% level)

Ohio Table 2. Tuber shape and appearance , hollow heart ratings, internal necrosis ratings, and chip color for varieties grown at Wooster, Ohio – 1992.

Variety	z ----- Tuber Data -----		Hollow Heart %	Internal Necrosis %	y Chip Color
	Shape	Appear- ance			
AF1060-2	3	5	0	0	4
B0178-34	3	5	0	0	2
AF828-5	3	6	0	0	3
B0175-20	6	5	13	0	3
B0241-8	3	6	30	0	4
Russet Norkotah	7	7	17	0	4
B0172-15	7	3	7	0	2
Superior	6	3	0	0	1
NY85	3	5	0	0	2
Monona	3	5	0	0	3
B0257-12	2	6	3	0	4
Castile	6	4	7	0	5
Eide Russet	6	6	3	0	5
Gemchip	2	6	10	0	3
MaineChip	3	6	5	0	2
NDT9-1068-11R	4	5	17	0	3
ND1538-1Rus	7	4	10	0	3
LA12-59	2	4	18	0	3
AC Novachip	4	5	7	0	3
NY84	3	6	5	0	3
NYE11-45	3	6	3	0	2
ND2224-5R	3	8	0	0	4
NC012-19	2	6	48	0	3
Katahdin (std)	3	5	38	0	3
Norland	3	6	0	0	5
Norchip	3	4	0	0	3
Atlantic	3	7	7	0	3

z See standard NE 107 rating system.

y PC/SFA standards; rating of 2 or below is acceptable chip color.

Ohio Table 3. Plant stand, percent blister, Agtron readings, and additional tuber data for varieties grown at Wooster, Ohio – 1992.

Variety	% Plant Stand	----Chip Data----		-----Tuber Data----- ^x		
		% Blister	Agtron E-5F	Skin Texture	Eye Depth	Skin Color
AF1060-2	93	30	25.9	6.3	5.0	6.0
B0178-34	89	0	32.8	5.0	5.3	5.3
AF828-5	93	10	29.9	6.0	5.8	6.0
B0175-20	93	20	32.2	6.7	5.7	5.3
B0241-8	84	20	29.3	5.8	6.8	6.5
Russet Norkotah	95	20	15.3	3.0	5.0	4.0
B0172-15	92	10	30.1	6.7	5.0	6.0
Superior	85	10	41.0	6.0	3.3	5.5
NY85	89	10	36.6	7.0	6.3	7.0
Monona	100	0	36.4	6.3	5.0	6.7
B0257-12	88	10	21.7	5.3	5.5	5.6
Castile	94	30	17.6	6.8	5.3	7.0
Eide Russet	82	20	14.1	4.0	5.0	5.0
Gemchip	88	40	29.3	6.8	6.3	6.8
MaineChip	97	0	54.4	6.5	6.0	7.0
NDT9-1068-11R	90	0	29.6	7.0	4.0	1.5
ND1538-1Rus	95	20	38.1	3.0	5.0	4.0
LA12-59	81	20	31.5	6.8	4.5	2.0
AC Novachip	96	10	28.9	6.7	5.3	6.2
NY84	81	30	31.1	6.5	6.5	6.5
NYE11-45	85	40	35.5	6.8	6.0	6.3
ND2224-5R	88	10	17.6	7.0	7.0	2.0
NC012-19	94	20	34.7	7.0	6.0	6.3
Katahdin (std)	93	20	28.3	5.8	5.0	5.8
Norland	93	40	14.0	7.0	4.8	2.0
Norchip	98	10	30.7	6.5	4.8	6.9
Atlantic	86	20	28.0	5.8	6.0	6.0

z Percentage of chips that develop blisters greater than 20 mm in diameter during the frying process.

y Agtron scale: 55 and above is acceptable chip color.

x See standard NE 107 rating system.

Pennsylvania

M.R. Henninger Rutgers University, New Brunswick, NJ
B. Christ Penn State University, University Park, PA

Introduction

The trial was conducted at the Russell E. Larson Agricultural Research Center near Rock Springs, Pa. Thirty-six varieties and clones were tested in 1992 which included white, red, russets and yellow flesh items.

Methods

All plots were single-row, 25 feet long and 3 feet wide with four replications in a randomized complete block design. Seedpiece spacing were all 10". All seed was obtained from the NE-107 Regional Project. Fertilization was 1000 lbs./A of 10-5-10 branded at planting. Pests were controlled and not a limiting factor. Plots were not irrigated, but rainfall was not a limiting factor in 1992.

All plots were planted on May 20, killed on September 15, harvested on October 4, and graded on October 27. Following harvest, the potatoes were held in a potato cellar at a temperature of 50°F to 60°F before grading and then stored at 50°F until chip, bake, and boil tests were conducted. Specific gravity was determined by the weight in air/water method.

Results

The 1992 growing season was cool with good rainfall. AF828-5, AF1060-2, and NY 84 all have very good marketable yields and nice tuber appearance with good baking and boiling scores, however none of these clones chipped acceptable. MN 12823 had the high yield but neither the tuber appearance nor the chip color were acceptable. The best chip color was obtained from: B0175-20, B0178-34, MN13450, NC012-19, NY 85 and NY 87.

Of the named varieties, Allegany and Kennebec had the best yield. However; AC Norvachip, Mainechip, Monona, and Norchip had the best chip color. Mainechip had the highest specific gravity with 1.102. Clones B0175-20 and B0178-34 also had specific gravities of 1.102.

In the baking test; Goldrush, ND671-4, and AF828-5 were among the best. When boiled; Norland, NC012-19, NDT9-1068-11, and AF828-5 were all very good. Goldrush was the highest yielding russet and the best russet overall. NDT9-1068-11 was a red that shown the most potential.

Pennsylvania Table 1. Yields, Specific Gravity, and Tuber Sizes for 36 Potato Varieties Grown at the Russell E. Larson Agricultural Center at Rock Spring, PA 1992.

Variety Names	Total Yield cwt/a	Market Yield		% of std.	% Tuber					% Over			% Culls	Spec. Grav.
		cwt/a	std.		Sizes (1)					1 7/8 2 1/2				
					1	2	3	4	5	1	7/8	2 1/2		
AC Novachip	439	413	121	4	27	59	10	0	96	70	2	1.082		
Allegany	464	451	132	2	18	43	31	5	98	79	0	1.077		
Atlantic - std.	355	341	100	4	28	56	12	1	96	68	0	1.094		
Castile	456	425	125	7	42	44	7	0	93	51	0	1.086		
Gemchip	429	404	118	6	35	52	7	0	94	59	0	1.082		
Katahdin	373	356	104	4	24	52	19	0	96	71	0	1.075		
Kennebec	491	453	133	4	22	52	22	0	96	74	3	1.083		
Maine Chip	377	345	101	9	55	36	1	0	91	36	0	1.102		
Monona	311	279	82	10	43	42	6	0	90	48	1	1.072		
Norchip	380	336	98	10	39	43	7	0	90	51	2	1.089		
Spartan Pearl	378	347	102	8	36	44	11	0	92	56	1	1.086		
Superior	363	340	100	5	34	53	8	0	95	61	1	1.084		
AF828-5	482	466	137	3	17	51	28	1	97	80	0	1.080		
AF1060-2	506	467	137	8	35	49	8	0	92	58	0	1.082		
B0175-20	387	359	105	4	29	60	7	0	96	67	4	1.102		
B0178-34	417	386	113	7	33	52	8	0	93	60	0	1.102		
MN 13540	392	350	102	11	57	32	0	0	89	32	0	1.080		
MN 12823	537	514	151	3	22	53	21	0	97	75	1	1.083		
NC012-19	412	401	117	3	17	51	29	1	97	81	0	1.091		
NY 84	506	482	141	4	20	49	26	0	96	76	1	1.070		
NY 85	300	275	80	8	50	40	2	0	92	42	1	1.091		
NY 87	408	384	112	6	42	45	6	1	94	52	0	1.080		

Pennsylvania Table 1. (Continued).

Variety Names	Total Yield cwt/a	Market Yield		% Tuber Sizes (1)					% Over			% Culls	Spec. Grav.
		cwt/a	% of std.	% Tuber Sizes (1)					% Over				
				1	2	3	4	5	1	7/8	2		
Specialty Varieties													
Chieftain - std.	478	466	100	3	25	54	18	0	97	72	0	1.075	
Norland	283	251	53	12	56	33	0	0	88	33	0	1.071	
Yukon Gold	369	345	74	5	20	54	21	0	95	76	2	1.087	
LAL2-59	423	400	85	5	22	44	27	1	95	73	1	1.085	
ND2224-5R	282	219	46	23	62	15	0	0	77	15	0	1.072	
NDT9-1068-11	505	488	104	3	23	60	14	0	97	74	0	1.073	
Russet Varieties													
Belrus - std.	267	233	100	13	62	23	1	0	87	25	0	1.088	
Eide Russet	337	287	123	15	54	30	2	0	85	32	0	1.083	
Goldrush	407	341	146	12	49	37	1	1	88	39	5	1.077	
Hilite Russet	346	299	128	14	48	38	1	0	86	39	0	1.077	
Russet Burbank	438	296	127	16	53	30	1	0	84	31	20	1.085	
Russet Norkotah	292	254	109	11	46	40	3	0	89	43	2	1.079	
B9922-11	285	266	114	7	35	49	10	0	93	59	1	1.086	
ND671-4	421	377	110	11	46	40	4	0	89	44	0	1.076	
CV(2)	12	15										3.	
W-D LSD .05	60	ns		4	11	9	6	ns	4	12	3	.003	

(1) Size 1 = Under 1 7/8, S2 = 1 7/8 TO 2 1/2, S3 = 2 1/2 to 3 1/4, S4 = 3 1/4 TO 4, and S5 = Over 4
(2) CV = Coefficient of Variation; W-D LSD.05 = Waller Duncan Test for Least Significant Difference.

Pennsylvania Table 2. Plant and Tuber Characters, Tuber Defects, Chip Color and Overall Rating for
36 Potato Varieties Grown at the Russell E. Larson Agricultural Center 1992(1).

Variety Names	PLANT & TUBER CHARACTERS										T U B E R D E F E C T S										OVER	
	M	C	T	S	D	A	U	E	S	G	S	H	G	S	H	H	N	R	CC	BAKE	BOIL	ALL
	t	l	x	h	p	p	n	y	G	C	S	S	R	B	H	H	N	R	CC	BAKE	BOIL	ALL
AC Novachip	6	6	7	5	5	7	7	7	7	7	9	9	7	9	0	0	0	3	2.3	2.3	5	
Allegany	8	6	6	2	8	8	7	5	9	9	8	9	7	9	0	0	0	5	2.2	2.5	6	
Atlantic	6	5	5	2	8	8	8	9	9	9	9	9	7	9	1	0	0	4	1.9	3.8	8	
Castile	6	8	8	6	6	7	6	6	7	9	9	9	8	9	0	0	0	6	1.9	2.3	6	
Gemchip	7	7	8	2	6	7	6	6	9	9	8	9	7	8	1	0	0	4	2.8	2.3	8	
Katahdin	6	7	8	3	5	7	7	7	9	9	8	9	5	5	0	0	0	7	2.3	2.4	6	
Kennebec	7	7	7	6	5	6	5	6	9	8	9	9	5	9	0	0	0	7	2.1	2.7	5	
Maine Chip	6	6	7	2	6	7	7	7	9	9	9	9	8	9	0	0	0	3	2.1	3.6	5	
Monona	5	6	8	2	7	6	6	6	9	7	9	9	8	9	0	0	0	3	2.8	2.8	5	
Norchip	5	6	7	2	7	6	5	5	7	8	9	9	7	9	0	0	0	3	2.8	3.1	5	
Spartan Pearl	5	6	6	2	8	7	7	7	9	9	9	9	9	9	0	0	0	5	2.0	2.8	7	
Superior	4	6	6	3	7	7	6	4	8	9	9	9	8	9	0	0	0	6	2.4	2.9	7	
AF828-5	8	6	6	2	7	8	7	7	9	7	9	9	7	9	0	0	0	7	1.6	2.1	8	
AF1060-2	7	6	7	2	6	7	7	5	9	8	7	9	8	8	0	0	0	8	1.9	2.3	7	
B0175-20	6	6	7	4	7	8	7	7	9	7	6	9	8	6	0	0	0	3	1.9	2.7	7	
B0178-34	6	6	6	2	5	7	6	7	9	8	9	9	7	2	0	0	0	3	2.0	2.2	7	
MN12823	7	8	8	5	3	6	4	4	8	9	8	9	9	9	0	0	0	8	1.9	2.1	6	
MN13540	5	7	8	4	6	7	7	6	9	9	9	9	7	9	0	0	0	3	3.0	3.1	7	
NC012-19	5	6	6	2	3	6	7	5	9	7	9	9	8	9	7	0	0	3	2.1	1.9	6	
NY 84	8	6	6	2	6	8	7	7	7	9	8	9	7	9	0	0	0	7	2.1	2.4	8	
NY 85	4	6	7	2	5	7	7	8	9	9	9	9	7	9	0	0	0	2	1.8	3.1	3	
NY 87	5	6	6	2	7	8	7	5	-	-	-	-	-	-	4	0	0	3	1.8	2.3	6	

Pennsylvania Table 2 (Continued).

Variety Names	PLANT & TUBER CHARACTERS										TUBER DEFECTS										OVER		
	M	C	T	S	D	A	U	E			S	G	S	H	G	S	H	N	R	CC	BAKE	BOIL	ALL
	t	l	x	h	p	p	n	y			G	C	S	S	R	B	H						
Specialty Varieties																							
Chieftain	7	2	8	2	5	7	7	5			9	9	9	0	7	9	0	0	8	2.1	2.4	7	
Norland	1	2	8	3	7	8	8	6			9	9	9	0	7	9	0	0	7	2.0	1.8	6	
Yukon Gold	4	8	7	2	6	7	7	7			9	7	8	4	8	9	4	0	8	2.0	4.0	8	
LA12-59	4	2	8	3	6	6	6	4			9	6	8	1	6	7	5	0	6	1.9	2.2	7	
ND2224-5R	3	2	8	3	7	8	7	8			9	9	7	0	9	9	8	0	9	3.4	2.2	5	
NDT9-1068-11	5	2	8	3	6	7	7	6			8	7	9	0	9	7	7	0	9	1.9	2.1	8	
Russet Varieties																							
Belrus	5	4	2	8	6	8	8	8			9	9	9	0	6	7	0	0	6	2.0	2.8	6	
Eide Russet	6	5	3	5	5	7	5	7			9	9	9	1	2	9	1	2	9	2.1	2.2	4	
Goldrush	5	5	3	6	7	7	6	7			8	6	9	0	9	9	0	0	9	1.4	2.5	7	
HiLite Russet	2	5	4	7	6	6	7	6			9	8	9	0	8	9	0	0	8	1.9	3.6	5	
Russet Burbank	8	5	6	8	7	4	3	6			3	9	9	0	7	9	0	0	7	2.8	2.9	1	
Russet Norkotah	4	5	2	8	7	7	6	7			9	7	9	1	8	9	1	0	8	2.0	3.3	5	
ND671-4	4	5	3	8	7	7	7	7			9	6	9	2	8	9	2	0	8	1.5	3.3	7	
B9922-11	7	4	2	7	5	7	6	7			9	8	9	2	4	9	2	0	4	1.9	4.1	4	

(1) See Pennsylvania Rating Table For Plant and Tuber Characters. CC = Chip Color on 11/18

Pennsylvania Rating Table. Codes and ratings for plant and tuber characters, tuber defects and chip color.

Plant Characters		Tuber Characters		Tubers Defects		Defect Rating		Ty = Plant Type	
Ty = Type		Cl = Color		SG = Second Growth		1 = Dead		1 = V. decumbent	
Sz = Size		Tx = Texture		GC = Growth Crack		2 = Very Severe		2 =	
Ap = Appearance		Sh = Shape		SS = Skin Set		3 = Severe		3 = decumbent	
AP = Air Pollution		Dp = Depth		HS = Heat Sprouts		4 =		4 =	
Mt = Vine Maturity		Ap = Appearance		GR = Green Tubers		5 = Moderate		5 = Spreading	
		Un = Uniformity		SB = Scab		6 =		6 =	
Bake and Boil		Ey = Eye Depth		HH = No. of Hollow Heart		7 = Slight		7 = Upright	
1 = excellent				HN = No. of Heat Necrosis		8 = Very Slight		8 =	
2 = good				R = Heat Nec. Rating		9 = No Symptoms		9 = Very Upright	
3 = fair									
4 = poor									
Plant / Tuber Characteristics									
Sz=Plant Size		AP=Appearance		AP=Air Pollution		Mt=Vine Maturity		Cl=Tuber Color	
1 = V. Small		1 = Very poor		1 = Dead		1 = Very Early		1 = Purple	Tx=Tuber Tex.
2 =		2 =		2 =		2 = Early		2 = Red	1 = Part Rus
3 = Small		3 = Poor		3 = Mod. Defol		3 =		3 = Pink	2 = Heavy Rus
4 =		4 =		4 =		4 = Med Early		4 = Dark Brown	3 = Mod. Rus
5 = Medium		5 = Fair		5 = Mod Injury		5 = Medium		5 = Brown	4 = Light Rus
6 =		6 =		6 =		6 = Med Late		6 = Tan	5 = Net
7 = Large		7 = Good		7 = Mild Injury		7 =		7 = Buff	6 = Sl. Net
8 =		8 =		8 =		8 = Late		8 = White	7 = Mod. Smooth
9 = V. Large		9 = Excellent		9 = No Symptoms		9 = Very Late		9 = Bright White	8 = Smooth
									9 = Very Smooth
Sh=Tuber Shape									
Dp=Tuber Depth		Un=Tuber Uniformity		Ey=Eye Depth		CC=Chip Color		Overall	
1 = V. Round		1 = V. Variable		1 = V. Deep		1 = Paper white		1 = Discards	
2 = Round		2 =		2 =		2 =		2 =	
3 = Round-oblong		3 = Flat		3 = Deep		3 =		3 =	
4 = Mostly Oblong		4 = Unacceptable		4 =		4 = Acceptable		4 =	
5 = Oblong		5 =		5 = Medium		5 = Borderline		5 = Some Merit	
6 = Mostly Oblong		6 = Acceptable		6 =		6 = Unacceptable		6 = Try Again	
7 = Mostly Long		7 = Good		7 = Shallow		7 =		7 = Good	
8 = Long		8 =		8 =		8 =		8 = Excellent	
9 = Cylindrical		9 = V. Round		9 = V. Uniform		9 = Black chip		9 = Name It	

Texas

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development and Testing

Seedling Program. Approximately 40,000 first-year seedlings, representing 361 families, were grown for selection near Springlake in 1992, and 254 original selections were made from this material. The 1992, first-year seedlings from Texas resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock during the winter of 1990-91. The remainder were obtained from Joe Pavek in Idaho (8,522), Bob Johansen in North Dakota (10,062) and David Holm in Colorado (4,521). The Texas program also supplied the North Dakota, Idaho, and Colorado programs with second, third and fourth size seedling tubers for selection.

Adaptation Trials. The 1992 growing season was marked by below average temperatures in late May and early June. July temperatures were near normal for the entire month. Above normal rainfall occurred during the months of May and June, resulting in excellent early-season vine growth. In general, vine growth was above average for the entire season. The variety and advanced selection trials at Springlake were planted on April 3 and harvested on July 27. Twenty-four russet varieties or advanced selections were tested for their adaptability to Texas conditions (Table 1). The outstanding entries based on total yield and general ratings were TX 1385-12Ru, Century Russet, Norgold "M" and Ranger Russet. While the performance of the new varieties Ranger Russet and Goldrush was good, other factors will have to be considered in determining whether or not they are potential replacement varieties for this area. After several years of testing, it appears that Frontier Russet offers little or no promise as a replacement variety. The selection ATX 84378-1Ru was grown from Colorado, Oregon and Idaho seed. The three different seed sources produced comparable yields of high quality tubers. This selection continues to show promise as a new variety for the Texas and Eastern New Mexico areas because of its count carton potential and heavy netting. The performance of the selection TX 1385-12Ru was excellent this year. It produced significantly higher yields of over 10 ounce tubers than all other entries and received the highest general rating.

The outstanding white entries based on total yield and general rating were AC 83306-1, AC 80545-1, ATX 85404-8W and Gemchip (Table 2). In general, specific gravities were quite high for this area. This may be partly due to the below average temperatures in early June. The performance of Atlantic and Snowden was disappointing this year. The outstanding red entries based on general rating were Red LaSoda, Viking, COTX 86146-2R and NDTX 8-731-1R.

Eighteen Texas Russet Norkotah strain selections were compared to Regular Russet Norkotah (Table 3). The outstanding entries based on total yield and general rating included TXNS 249, TXNS 296, TXNS 344, TXNS 223, TXNS 118, and TXNS 112. More importantly, most of the strains outperformed the original Russet Norkotah and produced more and bigger tubers. The selection TXNS 344 produced tubers that were very rough, and TXNS 446 and TXNS 134 produced a high percentage of small tubers. Generally, Norkotah strains with more upright plant type, greater vigor, and later maturity were higher in total yield.

The strip trial consisted of eleven potato varieties or strain selections and five promising advanced selections for which sufficient seed was available for strip planting of 300 foot rows (Table 4). The outstanding entries based on total yield and general rating were Century Russet, Red LaSoda, AC 80454-1, and NDTX 8-731-1R. Based on general rating, the outstanding entries were Century Russet, NDTX 8-731-1R, ATX 84378-1Ru and COTX 86146-2R. Century Russet continues to produce very high total yields of attractive tubers. The selection ATX 84378-1Ru performed quite well this year. This selection produced large, uniformly shaped tubers with a heavy russet skin. It produced the lowest number of tubers per plant (4.8), but had the largest tuber size (6.6 oz). It did produce a larger average of culls/No. 2 grade potatoes, primarily due to growth cracks. The white chipping selection AC 80545-1 produced a significantly higher total yield than all other white entries. The selection ATX 85404-8W performed quite well this year and had comparable specific gravity to AC 80545-1. The performance of the red selection NDTX 8-731-1R was good in comparison to the check varieties Red LaSoda and Viking. This selection produces uniformly shaped tubers with very nice red color. The yield of NDTX 9-1068-11R and COTX 86146-2R was somewhat disappointing this year; however, both selections produced smooth tubers with bright red skin.

Texas Table 1. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 22 russet potato varieties or advanced selections grown at Springlake, Texas - 1992.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1 CWT/A		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating 1/
		Total Yield	Over 10 oz.					
TX 1385-12Ru	403.7	381.7	187.1	6.8	1.082	Oblong	Russet	3.9
Century Russet	392.7	330.1	90.7	5.0	1.088	Long	Russet	3.3
AO 8478-1	374.0	257.5	8.4	4.3	1.077	Oblong	Russet	2.9
Norgold "M"	339.1	253.6	58.7	5.1	1.069	Oblong	Russet	3.5
Ranger Russet	338.5	301.4	94.2	5.7	1.079	Long	Russet	3.5
Goldrush	331.4	265.9	40.0	4.7	1.088	Oblong	Russet	3.2
AC 84069-3	331.1	210.7	15.5	3.6	1.080	Long	Russet	2.8
AO 81775-3	325.2	256.8	37.4	4.4	1.081	Oblong	Russet	2.9
ATX 84378-1Ru(OR)	322.0	306.5	72.6	6.0	1.075	Oblong	Russet	3.3
AC 78069-17	321.4	269.1	30.0	5.2	1.082	Oblong	Russet	3.2
TX 1216-1Ru	320.7	260.7	47.1	5.4	1.084	Oblong	Russet	3.3
ATX 84378-1Ru(CO)	306.5	291.4	117.8	8.2	1.064	Oblong	Russet	3.8
TX 1229-2Ru	284.9	271.0	112.3	7.9	1.085	Oblong	Russet	3.4
ATX 84378-1Ru(ID)	282.0	259.7	71.3	6.4	1.082	Oblong	Russet	3.3
CO 84205-5	280.4	175.9	3.9	3.3	1.054	Oblong	Russet	2.5
A 79216-1	273.9	222.6	26.1	4.3	1.077	Oblong	Russet	3.1
AC 84478-1	270.4	203.6	15.8	4.3	1.080	Long	Russet	2.7
A 79180-10	264.3	217.5	28.4	4.5	1.070	Long	Russet	3.1
CO 84074-2	263.9	195.2	5.5	4.5	1.088	Oblong	Russet	2.9
AC 84028-4	213.0	123.9	0.0	3.4	1.087	Oblong	Russet	2.7
A 8337-2	208.1	148.1	9.0	3.9	1.077	Long	Russet	2.8
ND 671-4Ru	208.1	96.5	0.0	2.8	1.075	Oblong	Russet	2.4
Russet Norkotah	207.8	183.9	22.6	4.6	1.080	Oblong	Russet	3.1
Frontier Russet	194.2	128.1	0.0	3.9	1.075	Oblong	Russet	2.9
AO 80432-1	190.4	134.9	2.6	3.9	1.087	Long	Russet	2.8
Average	289.9	229.9	43.9	4.9	1.078			3.1
L.S.D. (.05)	96.8	88.2	46.1	1.0				

1/ 1 = very poor to 5 = excellent

Texas Table 2. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 22 red and white potato varieties or advanced selections grown at Springlake, Texas - 1992.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1 CWT/A		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating 1/
		Total Yield	Over 10 oz.					
Red LaSoda	356.5	236.2	40.3	4.0	1.068	Oblong	Red	3.3
AC 83306-1	348.8	192.3	0.0	3.3	1.081	Oblong	White	2.9
AC 80545-1	320.7	200.7	0.0	3.7	1.084	Oblong	White	3.2
Viking	304.0	264.6	82.0	5.7	1.068	Oblong	Red	3.3
ATX 85404-8W	291.7	142.6	7.1	3.0	1.083	Oblong	White	3.3
COTX 86146-2R	289.8	202.0	39.4	3.9	1.080	Oblong	Red	3.8
Gemchip	261.4	188.4	12.6	4.2	1.080	Round	White	3.1
AWN 85540-1	261.4	164.6	67.8	4.5	1.086	Oblong	White	2.7
NDTX 8-731-1R	255.9	151.7	19.4	3.4	1.077	Oblong	Red	3.4
ND 2224-5R	250.4	161.3	0.0	4.0	1.069	Oblong	Red	3.2
NDO 3573-5	237.5	82.6	4.2	2.5	1.070	Oblong	Red	3.1
LA 72-14	221.7	125.2	7.1	3.1	1.071	Oblong	Red	3.0
AWN 85542-1	221.7	122.0	45.5	4.1	1.088	Oblong	White	2.7
LA 72-12	217.8	144.6	3.9	3.1	1.070	Oblong	Red	2.9
NDTX 9-1068-11R	216.8	136.2	16.5	2.8	1.072	Oblong	Red	3.2
TX 1229-6W	199.7	183.6	73.9	7.0	1.075	Oblong	White	3.1
Atlantic	195.9	117.1	22.6	3.4	1.085	Round	White	3.1
ND 1196-2R	157.8	58.7	0.0	2.4	1.071	Oblong	Red	2.9
Snowden	141.0	61.0	3.5	2.7	1.080	Round	White	2.7
NDO 3503-2	138.1	51.3	0.0	2.3	1.061	Oblong	Red	2.5
LA 72-13	137.8	30.3	0.0	2.1	1.063	Oblong	Red	2.8
LA 72-11	130.0	28.4	0.0	2.7	1.083	Round	Red	2.6
Average	234.4	138.4	20.3	3.5	1.083			3.0
L.S.D. (.05)	86.2	87.1	31.1	1.1				

1/ 1 = very poor to 5 = excellent

Texas Table 3. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 18 Russet Norkotah strain selections, as well as Russet Norkotah, grown at Springlake, Texas - 1992.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1 CWT/A		Average Tuber		Specific Gravity	Tuber Type	Skin Type	General Rating 1/
		Total Yield	Over 10 oz.	Weight in oz.					
TXNS 249	498.5	444.3	149.1	6.4	1.055	Ob long	Russet	3.8	
TXNS 296	468.5	413.3	177.1	6.9	1.057	Ob long	Russet	3.8	
TXNS 344	370.7	334.0	165.5	7.1	1.052	Ob long	Russet	3.8	
TXNS 223	359.1	307.8	91.3	5.8	1.055	Ob long	Russet	3.9	
TXNS 325	355.9	259.4	64.9	4.4	1.054	Ob long	Russet	2.9	
TXNS 106	353.6	264.9	68.7	5.5	1.062	Ob long	Russet	3.3	
TXNS 102	352.4	282.0	73.6	4.7	1.055	Ob long	Russet	3.5	
TXNS 282	345.9	268.8	73.2	5.4	1.063	Ob long	Russet	3.3	
TXNS 118	339.4	270.4	63.2	5.4	1.062	Ob long	Russet	3.8	
TXNS 134	335.6	263.6	64.5	4.9	1.060	Ob long	Russet	3.1	
TXNS 439	321.7	271.7	82.9	6.3	1.055	Ob long	Russet	3.3	
TXNS 278	313.0	253.9	66.1	5.2	1.057	Ob long	Russet	3.0	
TXNS 112	312.7	268.1	117.1	5.8	1.061	Ob long	Russet	5.0	
TXNS 410	293.9	193.6	13.9	4.2	1.062	Ob long	Russet	2.8	
Russet Norkotah	291.7	239.4	49.7	4.8	1.061	Ob long	Russet	3.1	
TXNS 551	286.9	243.6	63.9	4.8	1.060	Ob long	Russet	2.8	
TXNS 446	276.8	209.1	39.7	5.5	1.067	Ob long	Russet	1.0	
TXNS 507	261.7	192.3	38.1	4.0	1.054	Ob long	Russet	2.5	
TXNS 399	255.9	181.3	35.5	4.8	1.067	Ob long	Russet	2.5	
Average	336.5	271.7	78.8	5.4	1.060			3.2	
L.S.D. (.05)	94.4	99.6	46.4	1.3					
1/ 1 = very poor to 5 = excellent									

Texas Table 4. Total yield, yield of U.S. No. 1 potatoes, average tuber weight, specific gravity, tuber type, skin type and general rating of 17 potato varieties or advanced selections grown at Springlake, Texas - 1992.

Variety or Selection	TOTAL YIELD CWT/A	U.S.No.1 CWT/A		Average Tuber Weight in oz.	Specific Gravity	Tuber Type	Skin Type	General Rating 1/
		Total Yield	Over 10 oz.					
Century Russet	474.7	371.7	61.5	5.7	1.069	Long	Russet	4.0
Red LaSoda	472.8	350.9	39.3	5.4	1.062	Oblong	Red	3.8
AC 80545-1	437.1	271.9	2.2	4.3	1.074	Oblong	White	3.5
NDTX 8-731-1R	389.0	211.4	10.4	4.2	1.058	Oblong	Red	3.8
Norquold "M"	369.7	218.6	22.3	4.3	1.060	Oblong	Russet	3.0
Ranger Russet	369.1	292.0	75.8	5.9	1.079	Long	Russet	3.0
Viking	365.2	266.7	66.9	6.2	1.063	Oblong	Red	3.5
Snowden	345.5	102.2	5.6	3.2	1.080	Round	White	3.5
ATX 84378-1Ru	334.1	276.9	62.9	6.6	1.065	Oblong	Russet	4.0
TX 1385-12Ru	333.7	265.0	79.9	5.9	1.061	Oblong	Russet	3.8
ATX 85404-8W	320.1	152.0	0.0	3.8	1.073	Oblong	White	3.5
Russet Norkotah	292.0	188.7	15.8	4.7	1.067	Oblong	Russet	3.5
Atlantic	274.9	95.2	4.7	3.7	1.082	Round	White	3.5
Gemchip	265.8	160.5	0.0	4.0	1.065	Round	White	3.0
NDTX 9-1068-11R	263.5	165.0	23.5	4.6	1.062	Oblong	Red	3.5
COTX 86146-2R	261.1	180.5	15.8	5.0	1.057	Oblong	Red	4.0
Frontier Russet	205.2	101.1	3.9	3.8	1.083	Oblong	Russet	2.8
Average	339.6	215.9	28.9	4.8	1.068			3.5
L.S.D. (.05)	76.0	62.1	28.6	0.6				

1/ 1 = very poor to 5 = excellent

VIRGINIA

S. B. Sterrett and C. P. Savage, Jr.

Introduction

Trials were conducted at the Eastern Shore Agricultural Experiment Station in Painter, Virginia. These trials are part of an on-going project that evaluates promising clones for marketable yield, tuber quality and appearance, vine and tuber maturity, processing (chip) potential, and freedom from internal and external defects.

Methods

Trials were planted on March 17 in single-row plots on a Bojac sandy loam soil. Plots were 25 feet in length with 36 inches between rows and 12 inches between seedpieces. Trials were planted in a randomized complete block design with four replications. Fertilization included 100 lbs N, 43.7 lbs P, and 83 lbs K/A banded at planting, with 50 lbs N/A sidedressed 72 days later. Linuron (0.4 lb ai/A) was applied at drag-off on April 16. Irrigation (1 inch) was applied May 25. The round-white trials were harvested July 6; the russet trial was harvested July 7. Specific gravity was determined by the weight-in-air/weight-in-water method. Chip color evaluations were provided by Mr. Steve Molnar, Wise Foods, Berwick, Pa. Samples were held at ambient air

temperature and chipped 3 and 10 days after harvest.

Seasonal Observations

Growing conditions were nearly ideal, with average maximum and minimum temperatures near the 10-year average for April (+0.9°F max, -0.3°F min), but below the 10-year average for May (-4.5°F max, -4.3°F min) and June (-6.6°F max, -3.7°F min). Rainfall was relatively even in distribution.

Results

Round-White Trial. While the yield of several varieties and clones was similar to Superior (fresh market standard), the yields of B0564-9, B0622-2, and B0856-4 exceeded that of Superior by more than 10 percent (Table 1). The high yield of B0564-9 was combined with specific gravity exceeding that of Superior, good chip color, early vine and tuber maturity, attractive tubers, and freedom from internal and external defects. Both B0622-2 and B0856-4 had attractive tubers; B0856-4 was early in maturity with acceptable chip color. However, low specific gravity and susceptibility to growth cracking (particularly B0856-4) could limit the production potential of these two clones in Virginia.

Chip Trial. The yield of several clones was similar to that of the chip standard, Atlantic (Table 2). The specific gravity of B0175-20 and B0178-34 was also equal to that of Atlantic, but the tuber maturity was somewhat later. While poor chip color and greater susceptibility of B0175-20 to internal heat necrosis than Atlantic are serious concerns, B0178-34 may be a promising replacement for Atlantic for late chip contracts.

Russet Trial. Of the entries in this trial, B0169-56 and B0339-1 exhibited the highest marketable yield (Table 3) and the most attractive tubers (Table 4). Unfortunately, B0339-1 also exhibited the greatest susceptibility to internal heat necrosis of any clone evaluated in 1992. Additional evaluation of russetted clone B0169-56 is warranted for this growing area.

Ratings

Vine and tuber ratings were completed using the rating system of the U. S. Department of Agriculture regional project NE107. For vine ratings, maturity: 1 = senesced, 9 = totally green; air pollution: 1 = defoliated, 9 = no visible symptoms. For tuber ratings, shape: 1 = round, 5 = oblong, 9 = very long (cylindrical); size: 1 = very small, 9 = very large; appearance: 1 = very poor, 9 = excellent; skin maturity: 1 = totally peeled during harvest and grading, 9 = skin intact, and tuber defects: 1 = severe, 9 = none. Ratings of heat necrosis made on 20

tubers in the size range 2-1/2" to 3-1/4".

Acknowledgements

We thank Wise Foods, Inc., Berwick, Pennsylvania and Anheuser-Busch Co., Inc., St. Louis, Missouri for their assistance in these evaluations and chip color determinations. We gratefully acknowledge provision of seed by Kathleen G. Haynes, USDA-Beltsville; Robert L. Plaisted, Cornell University; and Alvin F. Reeves, University of Maine.

Virginia Table 1. Yield, marketable yield, percentage of yield by grade size distribution, and specific gravity of round-white trial grown for 111 days at Painter, Virginia, 1992.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield % of std. A	Size Distribution ² by class (%)				Specific Gravity ³	Chip Color ⁴ Days After Harvest	
			1	2	3	4		3	10
			cwt/A	cwt/A					
Atlantic	399	343	110	13	13	56	17	1.089	3 8
Norland	273	204	66	25	22	50	3	1.064	
Saginaw Gold	398	298	96	22	21	48	5	1.078	3 7
Superior (Std)	352	311	100	11	14	57	18	1.075	5 9
AF1331-2	399	328	105	16	17	57	9	1.076	
AF1333-1	339	259	83	22	25	51	1	1.069	
AF1513-1	319	261	84	17	18	57	6	1.079	
AF1556-3	291	239	77	15	15	52	15	1.074	
BO396-1	290	204	66	27	30	40	0	1.086	
BO473-6	343	239	77	29	32	38	0	1.079	
BO564-8	355	286	92	19	18	54	9	1.079	2 7
BO564-9	384	345	111	10	11	46	33	1.082	3 4
BO564-12	277	210	68	23	19	51	6	1.086	
BO585-5	345	292	94	13	13	57	14	1.076	
BO608-1	339	281	90	17	19	61	3	1.083	
BO610-2	391	300	96	23	22	54	1	1.079	
BO613-2	389	308	99	17	14	53	12	1.074	5 8
BO622-2	425	349	112	15	13	50	18	1.076	4 8
BO635-6	338	278	89	17	14	54	15	1.080	
BO682-6	327	288	93	12	10	59	19	1.085	
BO684-5	325	294	95	8	8	47	35	1.068	
BO856-4	396	345	111	10	10	43	34	1.072	3 5
BO866-8	332	271	87	17	16	52	14	1.069	
Waller Duncan									
LSD (k=100)	36	39							

¹Planted March 17, harvested July 6.

²Size Distribution: 1 = 1.5-1.88" in diameter; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25".

³Determined by weight-in-air/weight-in-water method.

⁴Unreplicated samples: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 2. Yield, marketable yield, percentage of yield by grade size distribution, specific gravity of chip trial grown for 111 days at Painter, Virginia, 1992.

Clone ¹	Yield >1-1/2" cwt/A	Marketable cwt/A	Yield % of std.	Size Distribution ² by class (%)				Specific Gravity ³	Chip Color ⁴ Days After Harvest	
				1	2	3	4		3	10
Atlantic (Std)	366	313	100	13	13	55	7	1.093	3	7
Superior	351	317	101	9	10	57	23	1.079	7	8
AF1433-4	311	217	69	13	18	59	11	1.079	--	--
AF1424-6	315	280	89	8	8	47	34	1.084	3	9
AF1475-16	346	317	101	8	10	60	21	1.081	3	6
BO175-20	352	307	98	12	12	62	14	1.096	4	7
BO175-21	306	259	83	12	13	60	11	1.094	7	8
BO178-30	374	311	99	16	14	58	11	1.087	3	6
BO178-34	355	319	102	9	9	54	27	1.094	3	5
BO209-1	340	317	101	5	6	50	38	1.079	3	5
BO256-1	352	300	96	14	14	56	15	1.090	2	6
NY88	248	193	61	21	17	50	11	1.086	8	3
NY91	305	258	82	14	14	56	14	1.088	5	8
NY94	378	326	104	12	13	55	19	1.086	3	5
NYK88-30	423	341	109	17	13	53	14	1.076	6	3
Waller Duncan	48	45								
LSD (k=100)										

¹Planted March 17, harvested July 6.

²Size Distribution: 1 = 1.5-1.88" in diameter; 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25".

³Determined by weight in air/weight in water method.

⁴Unreplicated samples: 1-4 = acceptable, 5 = marginal, 6 or greater = unacceptable.

Virginia Table 3. Yield, marketable yield, percentage of yield by size distribution, and specific gravity of russeted trial grown for 112 days at Painter, Virginia, 1992.

Clone ¹	Yield >1-1/2" cwt/A	Marketable Yield		Size Distribution ²				Specific Gravity ³
		cwt/A	Percentage of std.	1	2	3	4	
BelRus (Std)	234	157	100	33	55	12	1	1.085
B9922-11	253	194	124	21	54	17	5	1.087
B0169-56	319	233	148	27	53	17	3	1.084
B0311-2	263	211	134	18	47	26	7	1.083
B0324-25	289	210	134	27	56	15	2	1.083
B0329-1	225	132	84	41	49	8	1	1.076
B0338-2	261	177	113	32	57	8	3	1.080
B0339-1	318	245	156	22	55	19	3	1.079
B0348-2	198	147	94	26	52	20	3	1.081
B0455-8	247	200	127	18	52	24	4	1.076
B0493-8	297	255	162	12	49	23	13	1.079
Waller-Duncan								
LSD (k=100)	49	49						

¹Planted March 17, harvested July 6.

²Size Distribution: 1 = 1.5-1.88" in diameter, 2 = 1.88-2.5"; 3 = 2.5-3.25"; 4 = >3.25".

³Determined by weight in air/weight in water method.

Virginia Table 4. Plant and tuber characteristics and tuber defects for round-white, red-skinned, and russet clones grown at Painter, Virginia, 1992.

Clone	Vine ¹			Tuber			Tuber Defects ²			
	Maturity	Pollution	Air	Shape	Appear.	Skin Matur.	Sun-burn	Second Growth	Growth Crack	Heat Necrosis # of Tubers Rating
Atlantic	7	7	7	2	7	6	8	9	8	0 9
Norland	1	6	6	2	6	8	9	9	9	0 9
Saginaw Gold	7	7	7	3	7	7	9	9	9	1 8
Superior	4	6	6	3	6	8	9	9	9	0 9
AF1331-2	7	6	6	5	6	7	6	9	9	0 9
AF1333-1	4	7	7	4	7	8	8	9	9	1 8
AF1513-1	6	5	5	4	5	5	9	9	9	0 9
AF1556-3	5	7	7	4	7	6	7	9	9	0 9
B0396-1	6	5	5	3	5	6	9	6	8	0 9
B0473-6	5	7	7	3	7	7	9	9	7	0 9
B0564-8	6	8	8	2	8	8	8	9	9	0 9
B0564-9	7	7	7	2	7	7	8	9	9	0 9
B0564-12	7	7	7	2	7	7	9	9	9	0 9
B0585-5	8	6	6	2	6	5	7	9	8	0 9
B0608-1	8	6	6	3	6	5	8	8	9	0 9
B0610-2	8	6	6	4	6	5	9	9	8	3 5
B0613-3	8	7	7	3	7	6	6	6	9	0 9
B0622-2	7	8	8	2	8	6	9	9	8	0 9
B0635-6	7	7	7	2	7	6	8	9	9	2 8
B0682-6	8	7	7	4	7	8	9	9	9	0 9
B0684-5	7	6	6	3	6	5	7	9	8	0 9
B0856-4	8	8	8	2	8	7	7	9	7	0 9
B0866-8	8	7	7	3	7	5	8	9	9	0 9

Clone	Vine ¹			Tuber		Tuber Defects ²					
	Maturity	Air Pollution	Shape	Appear.	Skin Matur.	Sun- burn	Second Growth	Growth Crack	Heat Necrosis # of Tubers	Rating	
-----Chip Trial-----											
Atlantic	7	8	2	8	5	9	9	9	0	9	
Superior	5	8	3	7	8	9	9	9	0	9	
AF1433-4	4	8	2	7	8	9	9	9	0	9	
AF1424-6	6	8	3	5	5	9	9	7	0	9	
AF1475-16	5	6	3	7	7	8	9	9	0	9	
BO175-20	6	6	4	7	5	8	9	9	3	8	
BO175-21	5	6	4	6	6	8	9	6	0	9	
BO178-30	7	9	3	7	6	8	8	9	2	8	
BO178-34	8	9	3	8	6	7	9	8	0	9	
BO209-1	6	9	4	6	6	9	9	9	0	9	
BO256-1	6	8	3	8	6	8	9	9	0	9	
NY88	6	8	2	6	6	9	9	9	0	9	
NY91	7	7	2	6	6	8	7	9	0	9	
NY94	5	8	2	8	6	8	9	9	0	9	
NYK88-30	--	6	2	7	7	7	9	9	0	9	
-----Russet Trial-----											
BelRus	7	8	6	6	6	9	9	9	0	9	
B9922-11	6	7	7	6	5	9	9	9	0	9	
B0169-56	7	6	6	7	7	9	9	9	0	9	
B0311-2	6	8	7	5	6	9	9	9	0	9	
B0324-25	5	8	6	6	7	9	9	9	0	9	
B0329-1	5	7	6	5	6	9	9	5	1	8	
B0338-2	5	8	7	6	6	9	9	9	2	7	
B0339-1	5	8	7	7	6	9	9	9	5	5	
B0348-2	5	7	7	7	7	9	9	7	0	9	
B0455-8	5	8	6	6	7	9	9	8	0	9	
B0493-8	7	8	6	5	6	9	9	9	0	9	

¹Vine ratings taken 108 days after planting.

²Rating system for external defects: 1 = severe; 9 = none. Heat necrosis ratings determined for 20 tubers in the 2.5" to 3.25" size.

Disease, Pest, and Stress Resistances Available in Commercial Types

**Mark Martin, USDA/ARS
Prosser, Washington**

Abstract

As the culmination of a potato breeding and evaluation program conducted at Prosser, Washington, the past 35 years, this report lists 45 resulting lines available for distribution that have multiple resistance to diseases, pests, and stresses (Table 1). In most of the cultivars, foreign plant introductions, and enhanced germplasm lines on the list, resistances are combined with acceptable to superior horticultural characteristics (Tables 2,3). Several of these lines are adapted to commercial production, showing important advantages over currently-grown cultivars in regional and grower trials and disease nurseries. Each line on the list has combined resistance to at least three of the following diseases or pests: PLRV, PVY, Verticillium wilt, Sclerotinia wilt, powdery mildew, early blight, black dot, common scab, powdery scab, Columbia root-knot nematode, Colorado potato beetle, or spider mites (Table 1). None have resistance to all of these but some have resistance to as many as ten. They are all more tolerant to water and heat stresses than the dominant cultivar, Russet Burbank, and require less fertilization and use of pesticides, particularly aphicides and fungicides. The disease, pest and stress resistance genes available in this germplasm should be very useful to the Northwest potato industry. Based on results of Tri-State and Western Regional trials and trials in growers fields, the following nine resistant lines appear to be commercially acceptable in productivity, handling, storability, and/or processing characteristics: AWn8048-3, AO80432-1, AO81235-102, A81286-1, A81473-2, A8333-5, A83115-12, AO8478-1, and AO84275-3. These are derived from crosses made by Dr. J.J. Pavek, at Aberdeen, Idaho. Four were selected from progenies grown in Idaho (A), four from progenies grown in Oregon (AO), and one from a progeny grown in Washington (AWn). These nine and three other promising, but less resistant lines, A79180-10, A8390-3, and A83115-12, we are considering for release as cultivars. Several of these, along with a high quality, long storage line, A82622-52, also show promise in other potato growing regions, so apparently are widely adapted. Seed of another promising line A83008-8 will be available for more extensive commercial trials in 1994.

The lines listed in the Tables should be tried as parents for introducing disease, pest, and stress resistance into breeding programs.

Introduction

A USDA-ARS potato breeding program has been conducted at Prosser, WA, the past 35 yrs, led by Dr. William Hoyman the first 19 yrs and since 1976 by the author. This program will apparently be discontinued when I retire in October 1993.

At Prosser particular emphasis is placed on introducing resistances to diseases, pests, and stresses into potatoes useful to the Northwest industry. The overall objectives are to develop and identify genotypes that require less pesticides, water, and fertilizers; reduce risks associated with potato production; increase profits to growers, processors, and packers; and provide consumers with better potatoes to eat.

Breeding progress has been hindered by the complexity and difficulty of the objectives and by lack of well-adapted parents with high levels of resistance. Combining all essential horticultural characteristics into a clone is a formidable task when breeding a vegetatively propagated tetraploid crop like potatoes. Doing this while, at the same time, adding resistances to several diseases, pests, and stresses makes the task many fold more difficult, laborious, and time consuming.

After assuming leadership of the breeding program at Prosser, we initially focused on resistances to potato leafroll virus (PLRV), potato virus Y (PVY), and early dying diseases, primarily Verticillium wilt and early blight. The literature was reviewed and reported sources of resistance to each of these four diseases were collected from breeding programs in the United States, Canada, and other countries in the world. Evaluating these we found moderate to high levels of resistance to all four was available in domestic potatoes. However, most resistances were in round white types, poorly adapted to the Northwest.

As parental lines were obtained, they were mass intercrossed with each other and with long russets adapted to the Northwest, especially those known to process well and having some resistance. Pedigree crossing was also being done at Aberdeen with the same or similar resistant germplasm. Seed from both types of crossing was used to produce first generation progenies

that were screened in field disease nurseries. We also collected second and third generation clones from single hill plantings and preliminary evaluation trials conducted in surrounding states and evaluated these in disease nurseries. These were mostly derived from crosses made at Aberdeen. All the above types of progenies proved to be fruitful sources of clones with valuable disease, pest, and stress resistance.

As clones with high levels of resistance to a given disease were identified, their responses to other diseases and pests were tested and noted. Some were found to be resistant to all four diseases originally targeted. In addition, several were resistant to Sclerotinia wilt, powdery mildew, common scab, powdery scab, black dot, Colorado potato beetles, Columbia root-knot nematodes, and/or spider mites (Table 1). As these additional resistances were noted, mass intercrossing groups and disease nurseries were also established for scab, Colorado potato beetle, and Columbia root-knot nematodes.

Numerous lines have resulted from this program that can be successfully grown with reduced use of pesticides. Most would require no use of aphicides or fungicides, except for late blight control. Some require no insecticides for Colorado potato beetle control. Others would make a valuable genetic contribution to integrated pest management of Columbia root-knot. Because of their vigor, most multi-resistant lines can be grown with minimal or no use of herbicides. All offer improvements over the dominant cultivar, Russet Burbank (RB), in stress resistance, and require less irrigation and fertilization to produce a full crop. Our evaluation procedures and the performance of some of the best of these lines in tests the past two years are discussed in this report.

Materials and Methods

Regional and Tri-State Trials

During the 15 yrs regional trials have been conducted in the West, we have entered 25 lines for evaluation. Performances of 12 of these have been evaluated the past 3 yrs by cooperators in the coordinated Western Regional and Tri-State trials. Six were judged promising enough to be continued in 1993 trials, along with five new lines we entered. These coordinated trials, conducted over a wide area extending from Texas to Washington, evaluate all entries for growth, production, handling, and

processing characteristics, including their response to important diseases.

Trials in Commercial Potato Fields

In addition to regional trials, which are usually conducted on experiment stations, trials are conducted in commercial potato fields in each state. Promising lines, where seed is available, are tested in the "real world", comparing them to commercial cultivars. In 1992, we tested 12 lines in seven grower trials in the Columbia Basin area of Washington and Oregon. Four were conducted in cooperation with Dr. Robert Thornton and assistants of Washington State University, and with Dan Hane and others associated with Oregon State University. Another 18 less advanced, multi-resistant lines were evaluated in four of the trials. These trials were generally in center-pivot irrigated circles of Russet Burbank.

Trial Using Minimal Pesticide Applications

In cooperation with Thornton and Hane, trials were also conducted on the Othello, WA, and Hermiston, OR, experiment stations in which commercial cultivars and 28 multi-resistant lines were grown with minimal pesticide applications. These trials included the resistant lines entered in regional and grower trials. They were harvested in October so the value of resistances had time to be expressed. In cooperation with Sunspiced, Inc., a company that dehydrates potatoes, a similar trial was conducted to determine how much dry matter per acre these multi-resistant types can produce.

Trials in Disease Nurseries

All 45 lines listed in the Tables, along with commercial cultivars and other resistant breeding lines, have been grown in disease nurseries the past several years. These nurseries are grown in fields previously cropped to potatoes and well infested with soilborne pathogens, especially *Verticillium dahliae*. Every third or fourth row through these trials is planted with tubers infected with PLRV, PVY, or both. No aphicides, fungicides, or miticides, and minimal applications of insecticides like Sevin are applied to control Colorado potato beetles with little effect on aphid virus vectors. Tubers saved from disease nurseries are used as seed the next year to measure the benefits of resistance in chronically infected crops. Yields in disease nurseries are compared with those in comparable trials of the same lines where

soilborne and virus diseases are minimized by applications of pesticides equivalent to those used in commercial production.

Results and Discussion

Results of Regional and Tri-State Trials

Performances of multi-resistant entries in Regional and Tri-State trials compared favorably with that of RB and other commercial cultivars in total and No. 1 yields, tuber size, and specific gravity. This was true even though trials were harvested when RB and other commercial checks were dead and ready for harvest, but resistant entries were still healthy and bulking. Resistant entries also generally performed well in post-harvest evaluations by Dr. Loretta Mikitzel and others in the Tri-State group. Four lines, AO8478-1 (Line 78), AO84275-3 (Line 275), A81286-1 (Line 286), and AO80432-1 (Line 432), were judged especially promising and are being further evaluated in 1993 trials. Summaries of their performances in 1991 and 1992 regional trials and other trials are given below and in the tables.

Performance of Line 78

Line 78 has a medium-sized, prostrate plant and is resistant to PVY, Verticillium wilt, early blight, and common and powdery scab, but susceptible to PLRV. It often produces higher total yields than RB, and consistently has higher No. 1 yields and higher proportion of large tubers. Compared to RB, Line 78 has similar specific gravities, fewer knobs, less growth cracking, shatter bruising, and hollow heart, more blackspot bruise and internal brown spot, somewhat more reducing sugars and darker fry colors, but higher percent acceptable fries, less sugar ends, similar cooking time, similar acceptance by taste panels, more sprouting in storage, similar rot losses, and lower overall rating. Tubers of Line 78 have an unusually large number of eyes. This multi-resistant line should be evaluated as a medium-early to midseason type, useful for either out-of-field processing or fresh market. It is probably not adapted to long-term storage.

Performance of Line 275

Line 275 has a medium-large plant and is resistant to PLRV, PVY, Verticillium wilt, early blight, black dot, and common and powdery scab. Compared to RB, Line 275 generally had lower total yields, higher No. 1 yields,

and smaller tuber size in regional trials. These trials were harvested before Line 275 fully benefited from its resistances and demonstrated its potential. It sets more tubers than RB and requires a longer growing season for them to enlarge to acceptable size and shape and separate easily from stolons. In longer season trials, this line produces unusually high yields of top quality tubers with few oversize, very high percent No. 1's, high specific gravity, and excellent eating quality. Compared to RB, Line 275 has smaller, shorter, more uniform tubers with less knobs, heavier russetting, less growth cracking, similar shatter and blackspot bruising, and less hollow heart and net necrosis. It has higher levels of solids and less reducing sugars than RB before or after storage, and usually had lighter fry colors, fewer sugar ends, and higher percent acceptable fries. It usually cooks faster than RB and rates as high in taste panel evaluations. It is higher in protein and vitamin C than RB and lower in glycoalkaloids. The dormancy of line 275 is shorter than RB and it is damaged more by bacterial or Fusarium rots than RB, especially when immature tubers are harvested from under green plants. In one Hermiston trial toxic seedpiece syndrome caused numerous plants of Line 275 to die, expressing symptoms similar to blackleg. This line received higher overall ratings for post-harvest characteristics than RB when tubers were harvested from the Columbia Basin area of Washington and Oregon, but lower than RB for tubers harvested from Idaho. This is probably because of its need for a longer growing season to fully mature. This line should be evaluated as a late season processing or fresh market type, adapted to short-term storage. It also has potential of producing large yields of dry matter per acre for the dehydrated potato industry.

Performance of Line 286

Line 286 has large, vigorous plants and is resistant to PLRV, PVY, Verticillium wilt, early blight, black dot, and common scab. It generally produces higher total and No. 1 yields, and larger tubers than RB. Its specific gravity is inconsistent, sometimes higher and other times lower than that of RB. Compared to RB this line has larger, shorter, lighter russeted tubers with less knobs, growth cracking, shatter and blackspot bruising, hollow heart and vascular and net necrosis. At harvest, tubers of Line 286 are low in reducing sugars, producing fries that cook faster and are equal or better than those of RB in color and taste panel preference, with fewer sugar ends, higher protein content, and lower glycoalkaloids. Tubers of this line resist rotting and store well, though dormancy

is somewhat shorter than RB, and they tend to accumulate reducing sugars in cold storage. Tubers are of Kennebec type, having a buff to light russet skin that is not retained well in early harvests. Other than its effect on appearance, however, skin sloughing of this line is not a problem in processing. Total and No. 1 yields and tuber size are usually equal or superior to Shepody in early harvests. Its solids are somewhat lower than Shepody in early harvests, but because of low reducing sugars it processes into French fries equal in color and quality to Shepody. Because of multi-disease resistance, Line 286 has remarkable yield capacity if allowed to grow full season in regions like the Columbia Basin. Tubers become very large later in the season with undesirable appearance, though most will be graded as No. 1's for processing. As the growing season progresses, solids in Line 286 improve to a level equal to or better than RB. This line should be evaluated as: 1) an early season Shepody type, 2) a main season out-of-field or storage processing type, or 3) if grown full season, for use in the dehydrated potato industry.

Performance of Line 432

Line 432 produces a medium-large plant, resistant to PVY, Verticillium wilt, black dot, powdery scab, and heat and water stress. It is moderately susceptible to PLRV and early blight, and susceptible to common scab. In Tri-State trials, Line 432 generally had lower total yields than RB, similar tuber size and higher No. 1 yields and specific gravity. In trials where stresses occurred it far outperformed RB. Tubers are smooth, have a light russet skin, good length, no knobs, and seldom growth crack. Compared to RB, this line had more shatter bruise and sometimes more blackspot bruising but usually less hollow heart. It sprouted earlier than RB in storage and was damaged more by bacterial rots. Line 432 had levels of reducing sugars similar to RB, both at harvest and after storage, but often had lighter French fry color, less sugar ends, and higher percent acceptable fries. It sometimes did not rate as high in taste panel evaluations. It's cooking time was similar to RB. This line should be evaluated as a main season type to be processed at harvest or after short-term storage. Because of extraordinary stress resistance, it should be tried in areas where irrigation is not used and/or drought stress is encountered.

Performance in 1992 Grower Trials

In a trial on a farm near George, WA, planted April 21 and harvested Sept 15, a 148-day growing season, three of these four resistant lines produced higher total and No. 1 yields than RB, more tubers over 10 oz, and higher specific gravities. The increases in total yields ranged from 26 cwt/A for line 286 to 93 cwt for Line 78. Increases in No. 1 yields were even more impressive, ranging from 75 cwt for Line 286 to 137 cwt for Line 78. Improvements in specific gravities ranged from 4 points for Line 78 to 15 points for Line 275. This harvest was too early for Line 275, its tubers had not sized up yet. RB was mostly dead at harvest but these and other resistant lines were still green and bulking. When Dr. Dennis Johnson tested juice from RB and these resistant lines for presence of propagules of *Verticillium* and *Colletotrichum*, the cause of black dot, there were many more disease propagules in RB.

In a trial on McNary Farm, near Plymouth, WA, planted April 27 and harvested Sept 30, a 156-day growing season, three of the four resistant lines again produced higher total and No. 1 yields, a higher proportion of tubers over 10 oz, and much higher specific gravities. Increases in total yields ranged from 7 cwt/A for Line 78 to 122 cwt for Line 432. Increases in No. 1 yields were again even more impressive, ranging from 54 cwt for Line 78 to 167 cwt for Line 432. Line 286 did not produce its usual high yields in this trial. It and the other resistant lines were still healthy and actively bulking at the time of harvest, while RB in the remainder of the field was completely dead. The resistant lines had much better specific gravities than RB, ranging from 8 points higher for Line 286 to 28 points higher for Line 275. Since growers in the Columbia Basin have problems producing specific gravities in RB desired by the French fry industry, these resistant lines offer an important advantage in this regard.

In a trial on Sunheaven Farms, south of Prosser, planted April 29 and harvested Sept 29, a 155-day growing season, all four resistant lines produced higher total yields, three of four had higher No. 1 yields, two of four a higher proportion of tubers over 10 oz, and three of four had higher specific gravities than RB. Increases in total yield ranged from 13 cwt/A for Line 78 to 160 cwt for Line 432. Increases in No. 1 yields ranged from 11 cwt for Line 78 to 178 cwt for Line 432. Improvements in specific gravity ranged from 2 points for Line 78 to 19

points for Line 275. The total yield of Line 275 was higher than RB but it needed another 3 wk of bulking to develop acceptable tuber size and shape for processing. Again resistant lines were still bulking at the time of harvest.

A long season trial conducted on the AgriNorthwest Research Farm near Plymouth, was planted April 8 and harvested Oct 20, a growing season of 196 days. Unfortunately, severe heat stress during bulking and a devastating Colorado potato beetle infestation late in the season reduced the number of effective growing days considerably, so yields of neither RB nor the resistant lines reached their potential. However, compared to RB all four resistant lines produced higher total and No. 1 yields, three of four had a higher proportion of tubers over 10 oz, and all had higher specific gravities. Increases in yield ranged from 9 cwt/A for Line 286 to a remarkable 211 cwt for Line 432. Because of the more severe effects of heat stress on RB than on these relatively stress resistant lines, the increases in No. 1 yields were dramatic, ranging from 69 cwt for Line 275 to 298 cwt for Line 432. It was in this trial that the heat and water stress resistance of Line 432 became evident. On a day when temperatures were near 120 °F, this line was standing up with a fresh green appearance in all four reps when other lines around it, including RB, were dull colored and wilted, even though the soil was moist. This stress resistance resulted in Line 432 having a No. 1 yield more than double that of RB. Improvements in specific gravity over RB ranged from 4 points for Line 286 to 26 points for Line 275.

Results of these four grower trials, conducted in various parts of the Columbia Basin on differing soil types, indicated these four multi-resistant lines offer advantages over RB in total and No. 1 yields, tuber size, and specific gravities. These advantages were expressed even though three of the trials were conducted under cultural conditions designed for RB and harvested when RB died, but while resistant lines were still healthy and increasing in yields and quality. When allowed to grow for another 2-3 wks in other trials not reported herein, they have been much superior to RB. There are probably cultural practices, other than those used for RB, that would be advantageous for these resistant lines and for growers. The results of dozens of performance trials on these lines grown under a wide range of cultural conditions, offer convincing evidence they will produce full crops with less fertilization and irrigation and less use of pesticides of all kinds. The consistent advantages of these resistant lines

in specific gravity and grade should appeal to growers, processors and packers.

Performance in Long Season trials

The potential value of the resistances of these four lines was demonstrated by results from the two long season, minimal pesticide trials conducted at Hermiston and Othello and the "dry-matter" trial conducted by Carl Henrickson, Sunspiced, Inc., near Moses Lake, WA.

In the Hermiston trial, every fifth row through the field was planted with tubers known to be infected with PLRV and PVY viruses, the field was sprayed only with pyrethroids for Colorado potato beetle control, and the plants were severely exposed to Verticillium wilt and early blight. Disease exposure started early and was severe throughout the season. Line 432 was inadvertently left out of this trial. The other three resistant lines produced much higher total and No. 1 yields, higher proportion of tubers over 10 oz (RB produced none), and higher specific gravities. Compared to RB, increases in total yields ranged from 156 cwt/A for Line 78 up to 536 cwt/A for Line 286. Line 286 produced almost three times as much total yield as RB and over four times as much No. 1 yield. Improvements in specific gravity over RB ranged from 7 points for Line 286 up to 19 points for Line 275.

At Othello, sources of viruses were not introduced, some pesticides were applied, and the trial was planted where there was minimal exposure to Verticillium wilt. Consequently, disease exposures were not severe. As a result, the total yield of RB was unusually high, over 900 cwt/A, but Line 78 was equally high, and Lines 275 and 286 produced even higher yields of 1069 and 1273 cwt/A, respectively. All four resistant lines produced much higher No. 1 yields than RB. Increases in this important attribute ranged from 109 cwt for Line 275 to 241 cwt for Line 286. Compared to RB all had a much higher proportion of tubers larger than 10 oz. Lines 78 and 286 had specific gravities similar to RB, but Line 432 was 12 points higher and Line 275 was 18 points higher.

Unfortunately, RB was not entered in the "dry-matter" (DM) trial. The PLRV resistant cultivar Abnaki, which usually yields as much or more than RB, yielded 554 cwt/A with a specific gravity of 70, which would result in 5.1 tons of DM/A. Line 286 yielded 776 cwt with specific gravity of 89, which would result in 8.8 T of DM/A, and Line 275 yielded about the same but with a specific

gravity of 112, which would result in 10.8 T of DM/A. Therefore, when allowed to grow full season, Line 286 would produce over 50% more DM/A than would be expected from RB, and Line 275 would produce more than twice as much. If yields in the Othello trial discussed above are converted to dry matter, the RB yield would be equivalent to 8.6 T/A, Line 78 yield would be 8.7 T/A, Line 275 would be 12.1 T/A, Line 286 would be 12.2 T/A and Line 432 would be 7.9 T/A.

Five other multi-resistant lines, AWn86524-5, AWn85540-1, AWn85542-9, AWn86524-1, and AWn84181-9, that have less desirable tuber type, produced yields of 10.4, 11.6, 12.5, 13.8, and 14.5 T of DM/A in the Sunspiced trial. This is equivalent to wheat or corn crops of 500 to 700 bu/Ac! In the Othello trial lines Ds76-2, AWn85542-1, AO77224-1, AWn84181-9, Tr2275-9, Wn-5, AWn85540-1, and AWn85510-2 produced dry matter yields of 10.2, 10.2, 10.3, 10.8, 11.4, 11.8, 12.3, 12.4, and 13.5 T/A. Two South American cultivars, Serrana and Achirana, also produced high yields of dry matter, 10.7 and 12.4 T/A, respectively. Some of these multi-resistant lines should be useful for production specifically for use in the dehydrated potato industry or for production of ethanol fuel or starch.

It is important to note, however, that a grower could not harvest all his potato crop in October to take advantage of high yield potentials of multi-resistant types. The possibility of damaging frosts, fall rains, and bruising problems associated with harvests under cold conditions allows limited harvesting this late. The very large tuber size and excessive plant growth associated with such high yields can also be problems. Incidentally, results of studies we conducted several years ago indicate large plants associated with disease resistance make good cattle feed or add to the ethanol producing potential of potatoes, if means can be devised to harvest them.

Performance in Disease Nurseries

The four lines emphasized above and the other lines listed in the Tables will generally become infected with viruses and early dying diseases when grown in nurseries where they receive the severe disease exposures which occurred in both 1991 and 1992. They are not immune to these diseases. However, compared to RB and other commonly grown cultivars, fewer plants of these resistant lines become infected, symptoms occur later in the season, and symptoms are generally not as severe. Because of reduced disease damage, these lines remain

relatively healthy much longer in the fall and continue to improve in yields and quality. In early September harvests of plots in disease nurseries, resistant lines had total yields similar to RB but were often superior to RB in No. 1 yields and specific gravities. In later harvests in early October, they were consistently much superior to RB in total and No. 1 yields and specific gravities. The severe disease conditions in these nurseries would not be found in commercial production. Under the relatively mild disease exposures normally encountered in commercial fields, there would be no need for growers to apply aphicides or fungicides when growing these resistant types. Sprays with pyrethroids might be needed to control Colorado potato beetles except in those lines resistant to this pest.

Performance in Chronic Disease Trials

When virus diseased tubers of RB and the four resistant lines were used as seed to plant chronic disease trials, the value of resistance was even more dramatically demonstrated. Seed tubers of RB infected with either PLRV or PVY resulted in crops that produced few tubers of any kind and no marketable tubers. Chronically infected seed tubers of other cultivars grown in the Northwest resulted in similar disastrous losses, with the exception of Shepody which produced a fair crop in chronic PVY trials. The four resistant lines all produced at least a moderate crop, and Line 286 produced almost a full crop in both 1991 and 1992 chronic trials. Most other lines listed in the Tables produced well in chronic trials. Growers in countries with well-established seed certification programs would not knowingly plant infected tubers but it would be comforting to know diseased tubers inadvertently planted would result in little or no losses. In underdeveloped nations where growers commonly plant non-certified seed, often badly infected with viruses, these levels of multiple resistance would have great value.

Performance of Resistant Lines in Other Regions

Seed of three of these resistant lines, 78, 275, and 286, was sent to Wisconsin and North Dakota for trials. They performed well in five trials in these two states. In general these resistant lines produced higher total and No. 1 yields than RB and other commercial cultivars. This was surprising, since these are areas with relatively short growing seasons where the resistance of these lines would have little opportunity to express its benefits.

Apparently, the adaptability of these lines extends beyond the Northwest.

Summary

The above-described results, recently obtained in the Western Regional breeding and evaluation program and in disease nurseries and grower trials, indicate the germplasm enhancement efforts at Prosser have resulted in development and selection of valuable multi-resistant breeding parents. These are particularly well adapted to Columbia Basin growing conditions, producing very high total and No. 1 yields with excellent quality when allowed to grow full season and express the benefits of their virus and early dying resistances. Some have horticultural potential that may make them useful as commercial cultivars. The performance of several of these lines compares favorably with that of RB. Some bruise as bad or worse than RB. This bruising is often associated with high solids. Few of these lines store as long as RB, but most will store to mid-spring without sprout inhibitors. Sprout inhibitor studies should be conducted to determine how long their storage can be extended. Not many of these resistant types have the tuber length of RB nor have as many eyes on the tubers.

The multi-resistant germplasm described herein should pay large dividends for all aspects of the potato industry in the future. Some lines are being evaluated as multi-resistant "gene packages" adapted to large scale, commercial production. Most will require one or two more crosses with established cultivars or breeding parents adapted to the needs of potato industries in particular regions.

A detailed report of the performance of the four lines emphasized above is being published in Proceedings of the 1993 Washington State Potato Conference. Those desiring reprints of this report or wanting tubers or *in vitro* plantlets of lines in the Tables, contact: Dr. Mark W. Martin, USDA-ARS, IAREC, RR 2 Box 2953A, Prosser, WA 99350-9687 before October 1. After that contact either Dr. P.E Thomas or Dr. C.R. Brown at this address. Seed might also be obtained from Mr. Steve James, COARC, 850 NW Dogwood Ln, Madras, OR 97741, who is maintaining and increasing seed of these lines.

Table Footnotes

Table 1.

- ¹PLRV = potato leafroll virus; PVY = potato virus Y; Vert = Verticillium wilt; EBLT = Early Blight; BDot = Black Dot; Sc = Common scab; PSc = Powdery scab; Nema = Columbia root-knot nematode; CPB = Colorado potato beetle.
- ²Total glycoalkaloids, Tbrs = small immature tubers; Plts = young plant tissue in August.
- ³S = susceptible, R = resistant; V = very. These are based on visual symptoms.
- ⁴In tubers vlo = very low (<6 mg/100gm); lo = 6-10 mg; md = medium (11-20 mg); hi = high (21-30 mg); vhi = >31 mg.
In plants vlo = <50 mg; lo = 51-100 mg; md = 101-150 mg; hi = 150-200 mg; vhi = > 201 mg.

Table 2.

- ¹Xing = Crossing experience: N = not successful; F = has functioned as female; M = has functioned as male. Sdbl = Number of open-pollinated seedballs observed in field trials: N = none; F = few; Md = moderate numbers; M = many; V = very.
Plt = plant size: Sm = small; Md = medium; Lrg = large; V = very.
Mat = maturity of tubers (not plants): E = early; Md = midseason; L = late; V = very.
Tp = tuber type: Rnd = round; Bl = blocky; Obl = oblong; lg = long.
Skin: Rs = russet; Wh = white; Bf = buff; Pi = pink; L = light; H = heavy.
Yld = yield; %ls = percent U.S. No. 1's; SG = specific gravity: Hi = high; Md = medium; Lo = low; V = very.
Eyes: M = many; Md = medium; F = few; V = very.

Table 3.

- ¹HH = hollow heart; VNec = vascular necrosis; NetN = PLRV net necrosis; Flesh = flesh color; Shat = shatter; Blsp = blackspot; Spr = sprouting; Shriv = shriveling of tubers; Col = overall color of French fries; Limp = limpness; SugE = sugar ends.
- ²S = susceptible, R = resistant; M = moderate; V = very.
- ³Wh = white; Yl = yellow; Lt = light; Dk = dark; V = very.
- ⁴gd = good; pr = poor; md = medium; v = very.

Table 1. Disease Resistant Germplasm Available for Testing¹

Line	PLRV	PVY	Vert	EBlt	BDot	Sc	PSc	Nema	CPB	Alkaloids ²	
										Tbrs	Plts
	³									⁴	
R Burbank	VS	MR	MS	MS	S	R	R	VS	VS	vlo	lo
Elba	MS	R	R	MR		S		VS	VR	md	vhi
Abnaki	R	MR	S	VS		S		VS	MR	lo	hi
Serrana	R	R	VR	R		S		VS	MS	vlo	lo
Bzura	MR	R	VR	R		S	VS	VS		lo	md
Cisa	R	R	R	MS		R?	MR	MS	S		
Pilica	VR	VR	VR	R		MS		S	VR	vhi	vhi
V2	MS	R	VR	R		R?				hi	vhi
G6582-3	MS	VR	VR	VR		S		S			
Pirola	VR	VR	VR	R		S		S	MR	lo	vhi
79V100-40	VS	MR	R	R		R?		VS		hi	vhi
ZC109-5	MR	R	MR	MS		S		VS	MS	md	md
Achirana	MR	R	MR	MS	VS	S	VS	S	MR	vhi	hi
Wn726-3	MR	MR	MR	MS		S	R	MS	MS	lo	md
76Ds-1	MS	MR	MR	S		S		S	S		
76Ds-2	MR	MR	MR	MS		S	R	MS	MS	md	md
79Ds500-11	VR	VR	VR	VR		S		VS	MS	vhi	vhi
87Tr2210-1	S	VR	VR	VR		MR	R	VS	MS		
87Tr2246-1	R	VR	VR	VR		R		S	VR	md	vhi
87Tr2275-9	VS	R	R	MS		MR	R	S	MS		
A077224-3	MR	R	R	MR		MR	R	MR	MR	lo	lo
A79216-1	MS	MR	R	MR	R	MS	R	S	S		
AWn8048-3	MS	MR	R	R		S	R	S	MS		
A080432-1	MS	MR	R	MS	MR	S	R	S	MS		
A081235-102	MR	MR	R	MR		MR	R	MS	S	md	vlo
A81286-1	MR	MR	VR	R	MR	R	MS	S	MS	vlo	lo
A81473-2	S	MR	VR	R	VS	MS	R	S	VS		
A81478-1	VS	MR	R	MR	R	R	R	S	S		
A82622-52	VS	R	MR	MR		S	R	MS	MR		
A83008-8	MR	MR	VR	VR		R		S	S	lo	vhi
A8333-5	VS	R	MR	MR		MR	R	MS	MS		
A83115-12	S	MR	R	MR		R	R	MS	MS		
A08478-1	S	MR	R	MR	MR	R	R	S	MR	md	vhi
AWn84181-9	VS	MS	MR	S		S	R	S			
A084275-3	R	MR	VR	R	VR	R	R	S	S	vlo	vlo
AWn85510-2	S	VR	VR	R		R	R	MS	R		
AWn85531-7	S	R	VR	MS		R?					
AWn85540-1	VR	VR	VR	R		R	VS	MS	MS	lo	vhi
AWn85542-1	R	VR	VR	VR		MR	S	VS		hi	vhi
AWn85542-9	VR	VR	VR	VR		MS	R	MR	VR	vhi	vhi
AWn86514-1	VS	MR	VR	R		MS		S			
AWn86514-2	VS	MR	VR	R		R?	R	R		hi	vhi
AWn86524-2	R	VR	R	R		R?		MR		md	vhi
AWn86524-4	R	VR	VR	R		MR	MS	R		vhi	vhi
AWn86524-5	S	R	VR	MR		MS?	R	R			
Bud 42	S	MR	R	MS		MS		S	S		

Table 2. Crossing Fertility and Plant and Tuber Characteristics of Disease Resistant Germplasm¹

Line	Xing	Sdbl	Plt	Mat	Tp	Skin	Yld	%ls	SG	Eyes
R Burbank	N	VF	Lrg	Md	Lg	Rs	Hi	Lo	Md	M
Elba	F	VF	Lrg	Md	Rnd	Wh	Hi	Hi	Md	F
Abnaki	F	N	Md	VE	Rnd	Wh	VHi	Hi	Lo	Md
Serrana	F	VF	Lrg	L	B1	Wh	Hi	Hi	Md	Md
Bzura	?	VF	VLrg	L	Ob1	Wh	VHi	Lo	VHi	Md
Cisa	?	VF	VLrg	L	B1	Wh	VHi	Vlo	Hi	M
Pilica	F	VF	VLrg	VL	Rnd	Wh	VHi	Lo	VHi	Md
V2	?	Md	VLrg	L	Rnd	Wh	Md	Vlo	Md	Md
G6582-3	?	M	VLrg	L	Rnd	Wh	Hi	Lo	Lo	Md
Pirola	?	F	VLrg	L	Rnd	Wh	VHi	Md	Hi	Md
79V100-40	?	F	Lrg	L	B1	Pi	VHi	Md	Md	Md
ZC109-5	?	Md	Md	L	B1	Wh	Hi	Md	VHi	Md
Achirana	?	N	VLrg	Md	Rnd	Wh	VHi	Hi	Md	Md
Wn726-3	N	F	Sm	E	Ob1	LRs	Hi	Hi	VHi	F
76Ds-1	?	F	Sm	Md	Ob1	LRs	Md	Hi	Hi	VF
76Ds-2	?	Md	Md	E	Ob1	LRs	Hi	Hi	Hi	F
79Ds500-11	M	F	VLrg	Md	Ob1	Wh	VHi	Lo	Md	M
87Tr2210-1	?	M	Md	L	B1	Rs	Md	Hi	Hi	F
87Tr2246-1	MF	VM	VLrg	L	B1	LRs	VHi	Md	Md	Md
87Tr2275-9	?	F	Md	L	B1	Rs	Hi	Hi	Hi	F
A077224-3	MF	M	Lrg	L	Ob1	HRs	VHi	Hi	Md	Md
A79216-1	MF	Md	Md	E	Ob1	HRs	Md	Hi	Hi	Md
AWn8048-3	?	F	Md	E	Lg	Rs	Hi	Hi	Hi	F
A080432-1	F	F	Md	Md	Lg	Rs	Hi	Hi	Hi	Md
A081235-102	?	M	Md	L	Lg	HRs	Md	Md	Md	Md
A81286-1	MF	M	Lrg	Md	Ob1	LRs	VHi	Md	Md	M
A81473-2	MF	VF	Lrg	Md	Lg	Rs	Hi	Hi	Md	Md
A81478-1	MF	F	Md	Md	Lg	Rs	Lo	Md	Hi	Md
A82622-52	F	F	Md	Md	Ob1	Rs	Md	Md	VHi	F
A83008-8	?	N	Lrg	L	Lg	HRs	Md	Md	Hi	M
A8333-5	?	F	Sm	E	Lg	Rs	Hi	Md	Md	M
A83115-12	?	M	Md	Md	Lg	Rs	Md	Md	Lo	Md
A08478-1	MF	M	Md	Md	Lg	Rs	Hi	Hi	Md	VM
AWn84181-9	?	M	Md	Md	B1	LRs	VHi	Md	VHi	M
A084275-3	M	VP	Lrg	L	Ob1	Rs	Vhi	Hi	VHi	M
AWn85510-2	?	N	Vlrg	Md	Ob1	Bf	Hi	Hi	Hi	VF
AWn85531-7	?	N	VLrg	Md	Ob1	Pi	VHi	Md	VHi	F
AWn85540-1	F	F	VLrg	L	B1	Wh	VHi	Lo	Hi	VM
AWn85542-1	?	F	VLrg	L	B1	Wh	VHi	Md	Md	Md
AWn85542-9	F	F	VLrg	L	B1	Bf	VHi	Md	VHi	Md
AWn86514-1	?	F	Lrg	VL	Lg	Rs	Hi	Lo	VHi	F
AWn86514-2	F	F	Lrg	L	Lg	LRs	Hi	Md	VHi	Md
AWn86524-2	?	VF	VLrg	Md	B1	Bf	VHi	Lo	Hi	Md
AWn86524-4	?	VF	VLrg	Md	Rnd	Bf	VHi	Lo	Md	Md
AWn86524-5	?	F	Md	Md	Lg	Wh	Hi	Lo	VHi	VM
Bud 42	M	M	Md	Md	Ob1	Bf	Hi	Md	VHi	M

Table 3. Internal, Handling, Storage, and Frying Characteristics of Res Germplasm¹

Line	Internal			Flesh	Bruise		Storage			Fries		
	HH	VNec	NetN		Shat	Blsp	Spr	Shriv	Rot	Col	Limp	SugE
	2	2	2	3	2	2	4	4	4	4	4	4
R Burbank	MS	MS	VS	Wh	MR	MS	Vgd	gd	gd	gd	gd	pr
Elba	R	VS	VS	LtYl	MR	S	md	Vgd	gd	pr	vgd	md
Abnaki	R	VR	MR	Wh	MS	MR	pr	md	md	Vpr	md	pr
Serrana	MS	MR	S	Yl	R	R	Vgd	Vgd	Vgd	Vgd	gd	gd
Bzura	R	VS	S	Yl	Ms	Ms	gd	md	Vgd	gd	vgd	pr
Cisa	R	MR	MR	LtYl	Ms	R	md	md	Vgd	md	gd	gd
Pilica	VR	R	VS	Yl	MR	S	Vpr	md	gd	Vgd	Vgd	md
V2	MR	S	S	LtYl	R	R	pr	pr	gd	Vpr	md	md
G6582-3	VR	MR	R	Wh	R	MR	Vpr	pr	gd	pr	gd	pr
Pirola	VS	R	MR	LtYl	R	VS	gd	gd	gd	gd	gd	pr
79V100-40	MS	MS	S	LtYl	VR	VR	gd	Vgd	Vgd	gd	gd	md
ZC109-5	S	MS	MS	LtYl	R	MR	md	Vgd	Vgd	Vgd	Vgd	md
Achirana	S	S	S	LtYl	R	R	md	Vgd	Vgd	md	gd	gd
Wn726-3	R	MS	MR	Wh	MS	R	md	gd	Vgd	md	gd	md
76Ds-1	VR	R	R	Wh	VR	VR	md	Vgd	md	md	gd	md
76Ds-2	MR	R	MS	Wh	MS	MR	pr	gd	Vgd	gd	gd	gd
79Ds500A-11	VR	MS	MR	Wh	R	MS	md	md	Vgd	md	Vgd	md
87Tr2210-1	VS	MR	MR	Wh	MS	VS	gd	gd	Vgd	Vgd	Vgd	md
87Tr2246-1	MS	MR	MR	DkYl	MS	MR	gd	gd	gd	md	gd	md
87Tr2275-9	VS	MR	R	LtYl	MS	MR	Vgd	Vgd	Vgd	pr	gd	md
A077224-3	MS	R	VR	LtYl	R	R	gd	md	gd	Vpr	gd	gd
A79216-1	VS	S	MR	LtYl	R	R	md	md	md	md	gd	gd
AWn8048-3	MR	R	MR	Wh	MR	MS	gd	Vgd	gd	md	md	gd
A080432-1	MS	R	MR	LtYl	S	MS	gd	gd	gd	gd	gd	md
A081235-102	MR	R	MR	Wh	MS	MR	md	gd	gd	md	gd	md
A81286-1	MR	MR	MR	VWh	R	R	Vgd	Vgd	Vgd	md	gd	gd
A81473-2	S	MR	MR	Wh	MR	R	Vgd	pr	gd	md	md	gd
A81478-1	VR	VS	S	Wh	R	R	gd	gd	Vgd	md	md	md
A82622-52	R	MR	MR	Vwh	MR	MR	gd	Vgd	gd	Vgd	Vgd	Vgd
A83008-8	S	MS	MR	Wh	MR	S	md	md	md	md	gd	md
A8333-5	R	MR	MS	Wh	R	S	gd	gd	gd	md	gd	pr
A83115-12	R	R	MR	Vwh	MR	S	gd	md	Vgd	Vpr	md	gd
A08478-1	R	MS	MR	Wh	R	MS	md	pr	gd	Vgd	gd	gd
AWn84181-9	MS	S	MR	Wh	S	R	gd	gd	gd	gd	gd	gd
A084275-3	MR	S	MR	Vwh	MR	MS	pr	md	pr	gd	gd	md
AWn85510-2	MR	MR	MS	LtYl	MS	MR	md	md	pr	Vgd	Vgd	gd
AWn85531-7	R	R	MR	Wh	R	MS	gd	Vgd	pr	md	Vgd	gd
AWn85540-1	MS	MS	MR	DkYl	MS	MR	md	gd	pr	Vgd	gd	md
AWn85542-1	MS	S	MR	Yl	VR	VR	md	gd	Vpr	Vpr	md	gd
AWn85542-9	MR	R	R	DkYl	R	MR	md	gd	Vpr	md	gd	gd
AWn86514-1	MS	S	MS	Ltyl	MR	MS	Vpr	md	pr	pr	gd	pr
AWn86514-2	S	S	MS	LtYl	R	S	Vpr	pr	pr	md	Vgd	md
AWn86524-2	MR	S	S	Ltyl	MR	MR	Vpr	gd	Vpr	pr	gd	md
AWn86524-4	VR	S	MS	Wh	MR	R	Vpr	pr	Vpr	gd	md	gd
AWn86524-5	R	MR	MR	Wh	MS	MS	pr	md	gd	gd	gd	gd
Bud 42	MR	MS	MR	Wh	R	MR	md	gd	gd	md	gd	Vgd

